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COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS

REPORT OF THE COMMITTEE OF EXPERTS ON ITS EIGHTEENTH SESSION
(28 November - 7 December 1994)

Addendum 3

Annex 3: Amendments to CHAPTERS 5 to 16, Appendix A and the Index of the Recommendations on the Transport of Dangerous Goods.

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CHAPTER 5: SPECIAL RECOMMENDATIONS RELATING TO CLASS 3

Paragraph

5.2 Amend the beginning to read:

"Liquids are considered to be unable to sustain combustion for the purpose of these Recommendations ..." (remainder unchanged).

5.3.5 Add a new paragraph 5.3.5 as follows:

"5.3.5 Viscous substances which:

have a flash point of 23 °C or above and less than or equal to 60.5 °C;

are not toxic or corrosive;

contain not more than 20% nitrocellulose provided the nitrocellulose contains not more than 12.6% nitrogen (by dry mass); and

are packed in receptacles of less than 450 litre capacity;

are not subject to these Recommendations, if:

(a) in the solvent separation test (see 5.6.1 (c)) the height of the separated layer of solvent is less than 3% of the total height; and

(b) the flowtime in the viscosity test according to 5.6.1 (a) with a jet diameter of 6 mm is equal to or greater than:

(i) 60 seconds; or

(ii) 40 seconds if the viscous substance contains not more than 60% of Class 3 substances."

5.4 Replace the text "France...October 1925)" by the following text:

"France (Association française de normalisation, AFNOR, Tour Europe, Cedex 7, 92080 Paris La Défense):

French Standard NF M 07 - 019
French Standards NF M 07 - 011 / NFT 30 - 050 / NFT 66 - 009
French Standard NF M 07 - 036"

Between the references for Germany and the Russian Federation insert the following new reference for the Netherlands:

"Netherlands:

ASTM D93-90
ASTM D3278-89
ISO 1516
ISO 1523
ISO 3679
ISO 3680"

In the text for the United States replace "ASTM D 56-87" by "ASTM D 56-93".

5.6 (d) Amend to read as follows:

"The capacity of the receptacle used does not exceed 450 litres."

CHAPTER 6: SPECIAL RECOMMENDATIONS RELATING TO CLASS 6

Paragraph

6.1 Renumber as 6.1.1
Before new 6.1.1 add a new heading "6.1 **General**"

6.2 Renumber as 6.1.2

6.3 Renumber as 6.1.3
Change reference to "6.5" to "6.2"

6.4 Renumber as 6.3.1

Before new 6.3.1 add a new heading "6.3 **Grouping criteria**"

6.4.1 Renumber as 6.3.2

In the table of "GROUPING CRITERIA" , the reference "a/" and existing footnote a/ should be relettered "b/" . Add a reference to a new footnote "a" in the headings of the second and third columns (e.g., heading of second column to read "Oral toxicity LD_{50} (mg/kg) a/") and add a new footnote "a" below the table to read:

"a/ LD_{50} toxicity data for a number of common pesticides may be obtained from the most current edition of the document The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification available from the International Programme on Chemical Safety, World Health Organization (WHO), 1211 Geneva 27, Switzerland. While that document may be used as a source of LD_{50} data for pesticides, its classification system should not be used for purposes of transport classification of, or assignment of packing groups to, pesticides, which should be in accordance with these Recommendations."

6.4.2 Renumber as 6.4.1

Before new 6.4.1 add a new heading "6.4 **Inhalation toxicity**"

Change reference to "6.4.1" to "6.3.2"

6.4.3 Renumber as 6.3.3

6.4.4 Renumber as 6.3.4

Change reference to "6.4.3" to "6.3.3"

6.4.5 Renumber as 6.4.2

Change reference to "6.4.3" to "6.3.3"

6.4.6 Renumber as 6.5.1

Before new 6.5.1 add a new heading "6.5 **Methods for determining inhalation toxicity of mixtures**"

Change reference to "6.4.6.1" to "6.5.2"
Change reference to "6.4.6.2" to "6.5.3"

6.4.6.1 Renumber as 6.5.2

6.4.6.2 Renumber as 6.5.3

6.5 (a) Renumber as 6.2.1

Before new 6.2.1 add a new heading "6.2 **Definitions**"

6.5 (b) Renumber as 6.2.2

6.5 (c) Renumber as 6.2.3

Replace the second sentence with the following text:

"A solid substance should be tested if at least 10% of its total mass is likely to be dust in a respirable range, e.g. the aerodynamic diameter of that particle-fraction is 10 microns or less. A liquid substance should be tested if a mist is likely to be generated in a leakage of the transport containment. Both for solid and liquid substances more than 90% (by mass) of a specimen prepared for inhalation toxicity should be in the respirable range as defined above."

6.6 Delete the existing section 6.6 and insert the following new text:

"6.6 **Methods for determining oral and dermal toxicity of mixtures**

6.6.1 When classifying and assigning the appropriate packing group to mixtures in Division 6.1, in accordance with the oral and dermal toxicity criteria in 6.3.2, it is necessary to determine the acute LD_{50} of the mixture.

6.6.2 If a mixture contains only one active substance, and the LD_{50} of that constituent is known, in the absence of reliable acute oral and dermal toxicity data on the actual mixture to be transported, the oral or dermal LD_{50} may be obtained by the following method:

$$LD_{50} \text{ value of preparation} = \frac{LD_{50} \text{ value of active substance} \times 100}{\text{percentage of active substance by mass}}$$

6.6.3 If a mixture contains more than one active constituent, there are three possible approaches that may be used to determine the oral or dermal LD_{50} of the mixture. The preferred method is to obtain reliable acute oral and dermal toxicity data on the actual mixture to be transported. If reliable, accurate data is not available, then either of the following methods may be performed:

(a) Classify the formulation according to the most hazardous constituent of the mixture as if that constituent were present in the same concentration as the total concentration of all active constituents; or

(b) Apply the formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

where: C = the % concentration of constituent A, B ... Z in the mixture

T = the oral LD_{50} values of constituent A, B ...Z

T_M = the oral LD_{50} value of the mixture.

Note: *This formula can also be used for dermal toxicities provided that this information is available on the same species for all constituents. The use of this formula does not take into account any potentiation or protective phenomena."*

6.7 Insert a new 6.7 to read:

(new)

"6.7 **Classification of pesticides**

6.7.1 (Text of existing 6.6.1)

6.7.2 If the oral or dermal LD_{50} value for a pesticide preparation is not known, but the LD_{50} value of its active substance(s) is known, the LD_{50} value for the preparation may be obtained by applying the procedures in 6.6.

6.7.3 Table 6.1 contains a list of common pesticides and a reference to the UN numbers assigned to the proper shipping names that are relevant to the generic chemical group (e.g., organophosphorus pesticide) to which the particular pesticide belongs. The proper shipping name used in the transport of the pesticide should be selected from those referenced on the basis of the active ingredient, of the physical state of the pesticide and any subsidiary risks it may exhibit."

6.7)

6.8) Combine existing 6.7 and 6.8 as follows:

"6.8 **Segregation and decontamination**

6.8.1 Substances marked .....(Text of existing 6.7)

6.8.2 A railway wagon .....(Text of existing 6.8)"

Table 6.1: Amend the title as follows:

Table 6.1: LIST OF COMMON PESTICIDES WITH CORRESPONDING UN NUMBERS

Note: *The UN numbers provide a reference to the relevant proper shipping names.*

Table 6.1 Delete the 4 right columns of the table relating to packing groups.

Division 6.2 INFECTIOUS SUBSTANCES

6.9 (a) Renumber as 6.9.1 and amend to read:

"6.9.1 Infectious substances are those substances known or reasonably expected to contain pathogens.

Pathogens are defined as micro-organisms (including bacteria, viruses, rickettsia, parasites, fungi) or recombinant micro-organisms (hybrid or mutant), that are known or reasonably expected to cause infectious disease in animals or humans.

However, they are not subject to the recommendations for this division if they are unlikely to cause human or animal disease.

Infectious substances are subject to the recommendations for this division if they are capable of spreading disease when exposure to them occurs."

Delete the note following 6.9 (a).

6.9.2 Insert a new paragraph 6.9.2 to read:

(new)

"6.9.2 Infectious substances should be classified in Division 6.2 and assigned to UN 2814 or UN 2900, as appropriate, on the basis of their allocation to one of three risk groups based on criteria developed by the World Health Organization (WHO) and published in the WHO "Laboratory Biosafety Manual, second edition (1993)". A risk group is characterized by the pathogenicity of the organism, the mode and relative ease of transmission, the degree of risk to both an individual and a community, and the reversibility of the disease through the availability of known and effective preventive agents and treatment. The criteria for each risk group according to the level of risk are as follows:

(a) Risk Group 4: a pathogen that usually causes serious human or animal disease and that can be readily transmitted from one individual to another, directly or indirectly, and for which effective treatment and preventive measures are not usually available (i.e., high individual and community risk).

(b) Risk Group 3: a pathogen that usually causes serious human or animal disease but does not ordinarily spread from one infected individual to another, and for which effective treatment and preventive measures are available (i.e., high individual risk and low community risk).

(c) Risk Group 2: a pathogen that can cause human or animal disease but is unlikely to be a serious hazard, and, while capable of causing serious infection on exposure, for which there are effective treatment and preventive measures available and the risk of spread of infection is limited (i.e., moderate individual risk and low community risk).

Note: *Risk Group 1 includes micro-organisms that are unlikely to cause human or animal disease (i.e., no, or very low, individual or community risk). Substances containing only such micro-organisms are not considered infectious substances for purposes of these Recommendations.*"

6.9 (b) Renumber as 6.9.3 (Sub-paragraphs (i) to (iv) to be relettered (a) to (d)).

6.9 (c) Renumber as 6.9.4 and amend to read:

"6.9.4 *Biological products* are those products derived from living organisms, that are manufactured and distributed in accordance with the requirements of national governmental authorities which may have special licensing requirements, and are used either for prevention, treatment, or diagnosis of disease in humans or animals, or for development, experimental or investigational purposes related thereto. They include, but are not limited to, finished or unfinished products such as vaccines and diagnostic products.

Note: *Some licensed biological products may present a biohazard in certain parts of the world only. In that case competent authorities may require these biological products to comply with the requirements for infectious substances or may impose other restrictions.*"

6.9 (d) Renumber as 6.9.5.

6.9 (e) Renumber as 6.9.6 and amend to read:

"6.9.6 For the purposes of these Recommendations, biological products and diagnostic specimens are divided into the following groups:

(a) those known or reasonably expected to contain pathogens in risk groups 2, 3 or 4 and those where a relatively low probability exists that pathogens of risk group 4 are present. Such substances should be classified in Division 6.2 under UN 2814 or UN 2900, as appropriate. Specimens transported for the purpose of initial or confirmatory testing for the presence of pathogens fall within this group;

(b) those where a relatively low probability exists that pathogens of risk groups 2 or 3 are present. Specimens transported for the purpose of routine screening tests or initial diagnosis for other than the presence of pathogens fall within this group;

(c) those known not to contain pathogens."

6.9 (f) Renumber as 6.9.7.

6.10.1)

6.10.2) In the first sentence delete the word "all".

In the second sentence amend the reference to "6.9 (e) (ii)" to "6.9.5 (b)"

In the second sentence replace the words "should meet all the provisions for infectious substances except" by "need not meet the provisions for infectious substances"

In (d) amend the reference to "6.13" to "6.13.1"

6.11 Renumber text "The transport of...should be taken" as 6.11.1
Amend the existing section heading to read:

"6.11 **Responsibility of consignor"**

6.11 (a) Renumber as 6.11.2.

6.11 (b) Renumber as 6.11.3.

6.11 (c) Renumber as 6.11.4.

6.11 (d) Renumber as 6.11.5.

6.12 Renumber text "Consignors of infectious...animals during transport" as 6.12.1

Amend the existing section heading to read:

"6.12 **General packing requirements and communication of information**"

6.12.1 Renumber as 6.12.2.

6.12.2 Renumber as 6.12.3.

6.12.3 Renumber as 6.12.4.

6.12.4 Renumber as 6.12.5.

6.13 Renumber text "A packaging should include...dimension of 100 mm" as 6.13.1.

Amend the existing section heading to read:

"6.13 **Packing requirements**"

6.13.1 Renumber as 6.13.2 and amend to read:

"Inner packagings containing infectious substances should not be consolidated with inner packagings containing unrelated types of goods."

6.13.2 Renumber as 6.13.3.

6.13.3 Renumber as 6.13.4.

6.13.4 Renumber as 6.13.5.

6.13.5 Renumber as 6.13.6.

Insert a new sub-paragraph (b) as follows:

"(b) The code designating the type of packaging according to the provisions of 9.4."

Renumber the existing sub-paragraphs (b) to (e) as sub-paragraphs (c) to (f).

Add a new subparagraph (g) as follows:

"(g) for packagings meeting the requirements of 6.14.8, the letter "U" should be inserted immediately following the marking required in (b) above."

6.13.6 Renumber as 6.13.7 and amend example to read:

"4G/Class 6.2/92"

Amend the reference "6.13.5 (a), (b), (c)" to read "6.13.6 (a), (b), (c) and (d)".

Amend the reference "6.13.5 (d), (e)" to read "6.13.6 (e), (f).

6.14.4 (b) Amend to read:

"The sample should be subjected to a water spray that simulates exposure to rainfall of approximately 5 cm per hour for at least one hour. It should then be subjected to the test described in (a)."

6.14.6 Renumber existing paragraph 6.14.6 as 6.14.7.

Insert a new 6.14.6 to read:

"6.14.6 The competent authority may permit the selective testing of packagings that differ only in minor respects from a tested type, e.g. smaller sizes of inner packagings or inner packagings of lower net mass; and packagings such as drums, bags and boxes which are produced with small reductions in external dimension(s)."

6.14.7 Renumber existing paragraph 6.14.7 as 6.14.9 and amend the second sentence to read:

"Such waste should be transported in rigid, leakproof packagings or IBCs, in accordance with the provisions of Chapters 9 or 16 for solids, at the Packing Group II performance level, provided there is sufficient absorbent material to

absorb the entire amount of liquid present and the packaging or IBC is capable of retaining liquids."

6.14.8 (new) Insert a new paragraph 6.14.8 to read:

"6.14.8 Inner receptacles of any type may be assembled within an intermediate (secondary) packaging and transported without testing in the outer packaging under the following conditions:

(a) The intermediate/outer packaging combination should have been successfully tested in accordance with 6.14.4 with fragile (e.g., glass) inner receptacles;

(b) The total combined gross mass of inner receptacles should not exceed one half the gross mass of inner receptacles used for the drop test in (a) above;

(c) The thickness of cushioning between inner receptacles and between inner receptacles and the outside of the intermediate packaging should not be reduced below the corresponding thicknesses in the originally tested packaging; and if a single inner receptacle was used in the original test, the thickness of cushioning between inner receptacles should not be less than the thickness of cushioning between the outside of the intermediate packaging and the inner receptacle in the original test. When either fewer or smaller inner receptacles are used (as compared to the inner receptacles used in the drop test), sufficient additional cushioning material should be used to take up the void;

(d) The outer packaging should have successfully passed the stacking test in 9.7.6 while empty. The total mass of identical packages should be based on the combined mass of inner receptacles used in the drop test in (a) above;

(e) For inner receptacles containing liquids, an adequate quantity of absorbent material to absorb the entire liquid content of the inner receptacles should be present;

(f) If the outer packaging is intended to contain inner receptacles for liquids and is not leakproof, or is intended to contain inner receptacles for solids and is not siftproof, a means of containing any liquid or solid contents in the event of

leakage should be provided in the form of a leakproof liner, plastics bag or other equally effective means of containment;

(g) In addition to the markings prescribed in 6.13.6. (a) to (f) packagings should be marked in accordance with 6.13.6 (g).

6.15 Renumber text as 6.15.1.

Amend section heading to read:

"6.15 **Responsibility of carrier**"

6.16 Renumber text "The consignee...avaiable to him." as 6.16.1.

Amend section heading to read:

"6.16 **Responsibility of consignee**"

6.16.1 Renumber as 6.16.2.

6.17 Renumber text as 6.17.1.

Amend section heading to read:

"6.17 **Action to be taken in the event of damage or leakage**"

6.18 Renumber text as 6.18.1.

Amend section heading to read:

"6.18 **International notification**"

CHAPTER 7: SPECIAL RECOMMENDATIONS RELATING TO CLASS 7

Paragraph

7.5 Renumber existing paragraph 7.5 as 7.6.

Insert a new paragraph 7.5, as follows:

"7.5 Requirements for the transport of radioactive material are given in the IAEA Schedules of Requirements for the Transport of Specified Types of Radioactive Consignments. The relationship between UN numbers concerning Class 7, as given in Chapter 2, and the IAEA Schedules is shown in the following Table:

IAEA SCHEDULES	UN NUMBER
1	2910
2	2911
3	2909
4	2908
5	2912
6	3321
7	3322
8	2913
9	2915
10	2916
11	2917
12 */	3323
14	2919
6+13	3324
7+13	3325
8+13	3326
9+13	3327
10+13	3328
11+13	3329
12+13	3330
14+13	3331

In addition, UN 2977 and UN2978 are special cases without a unique relationship with IAEA Schedule(s).

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*/ This Schedule 12 is for radioactive material in Type C packages and was not published in IAEA Safety Series No. 80 (As Amended 1990). Consequently, Schedule 12 and 13 in Safety Series No 80 (As amended 1990) have been renumbered respectively Schedule 13 (for fissile material) and Schedule 14 (radioactive material transported under special arrangement).

CHAPTER 8: SPECIAL RECOMMENDATIONS RELATING TO CLASS 8

Paragraph

8.2 In footnote 1 amend reference "6.4.1" to read "6.3.2"

8.3 Delete the word "animal".

8.4(b) Change the reference to "steel, type P3 (ISO 2604 (IV):1975)" to "steel, type P235 (ISO 9328 (II): 1991)".

Add the following sentence at the end:

"An acceptable test is prescribed in ASTM G31-72 (Reapproved 1990)".

CHAPTER 9: GENERAL RECOMMENDATIONS ON PACKING

Paragraph

9.1.4 The reference "(See Chapter 10)" should be replaced with "(See Chapter 4)".

9.1.6 In the first sentence, after "infectious substances", insert "(other than waste clinical or (bio)medical substances)" and replace the word "and" between "9.2" and "9.3" with a comma; at the end of the first sentence, add "and 9.4".

9.1.9 (new) Add a new paragraph 9.1.9 to read as follows:

"9.1.9 Damaged, defective or leaking dangerous goods packages, or dangerous goods that have spilled or leaked may be transported in special salvage packagings mentioned in 9.7.1.11. This does not prevent the use of a bigger size packagings of appropriate type and performance level under the conditions of paragraph 9.3.15."

9.2.1 After the definition of "Inner receptacles" add the following definition:

"*Intermediate packagings* are packagings placed between inner packagings, or articles, and an outer packaging."

After the definition of "Reused packagings" add the following definition:

"*Salvage packagings* are special packagings conforming to the applicable provisions of this chapter into which damaged, defective or leaking dangerous goods packages, or dangerous goods that have spilled or leaked, are placed for purposes of transport for recovery or disposal."

9.3.10 In the table of examples (8th column), replace "under para. 9.7.5.5" with "9.7.5.4(c)".
(correction).

9.3.11 Amend to read:

"An empty packaging that has contained a dangerous substance should be treated in the same manner as is required by these Recommendations for a filled packaging, unless adequate measures have been taken to nullify any hazard."

9.3.15 Renumber existing paragraph 9.3.15 as 9.3.16.

Insert a new paragraph 9.3.15 to read as follows:

"9.3.15 Appropriate measures should be taken to prevent excessive movement of the damaged or leaking packages within a salvage packaging and when the salvage packaging contains liquids, sufficient absorbent material should be added to eliminate the presence of free liquid."

9.4.3 Amend to read:

"In the case of combination packagings and packagings described in 6.13, only the code number for the outer packaging should be used."

9.4.4 Amend the first three sentences in paragraph 9.4.4 to read:

"The letter 'T' or 'V' or 'W' may follow the packaging code. The letter 'T' signifies a salvage packaging conforming to the provisions of 9.7.1.11. The letter 'V' signifies a special packaging conforming to the provisions of 9.7.1.7." (Remainder of paragraph 9.4.4 unchanged, except the reference to 9.3.15 which should become a reference to 9.3.16).

9.4.7 Amend the introductory sentence to read:

"The following table indicates the codes to be used for designating types of packagings depending on the kind of packagings, the material used for their construction and their category; it also refers to the paragraphs to be consulted for the appropriate requirements"

Introduce aluminium jerricans in the table of assigned types and codes of packagings as follows:

In entry "3. Jerricans" between "A. Steel" and "H. Plastics" insert:

"

B.	Aluminium	non-removable head	3B1	
		----------		9.6.3
		removable head	3B2	

"

9.5.2.1 After "ISO 3574: 1986", amend to read "for steel" (delete the word "drums") (correction).

9.5.8 (new) Insert a new paragraph 9.5.8 (before the Note) to read:

"9.5.8 Example of marking for salvage packaging:

1A2T/Y300/S/94 as in 9.5.1 (a),(b),(c),(d) and (e)
USA/abc as in 9.5.1 (f) and (g)"

In the Note before 9.6, replace "in 9.5.6 and 9.5.7" with "in 9.5.6, 9.5.7 and 9.5.8".

9.6.3 Amend to read:

Steel or aluminium jerricans

3A1	steel, non-removable head	3B1	aluminium, non-removable head
3A2	steel, removable head	3B2	aluminium, removable head

9.6.3.1 Amend to read:

"Body and heads should be constructed of steel sheet, of aluminium at least 99% pure or of an aluminium base alloy. Material should be of a suitable type and of adequate thickness in relation to the capacity of the jerrican and to its intended use."

9.6.3.2 Amend to read:

"Chimes of steel jerricans should be mechanically seamed or welded. Body seams of steel jerricans intended to contain more than 40 litres of liquid should be welded. Body seams of steel jerricans intended to contain 40 litres or less should be mechanically seamed or welded. For aluminium jerricans, all seams should be welded. Chime seams, if any, should be reinforced by the application of a separate reinforcing ring.

9.6.3.3 Amend to read:

"Openings in jerricans (3A1 and 3B1) should not exceed 7 cm in diameter. Jericans with larger openings are considered to be of the removable head type (3A2 and 3B2). Closures should be so designed that they will remain secure and leakproof under normal conditions of transport. Gaskets or other sealing elements should be used with closures, unless the closure is inherently leakproof."

9.7.1.7 (f) Amend the end of the last sentence to read: "containing the liquid contents."

9.7.1.11 (new) Add a new paragraph 9.7.1.11:

"9.7.1.11 Salvage packagings (see 9.2.1) should be tested and marked in accordance with the provisions applicable to Packing Group II packagings intended for the transport of solids or inner packagings, except as follows:

(a) The test substance used in performing the tests should be water, and the packagings should be filled to not less than 98% of their maximum capacity. It is permissible to use additives, such as bags of lead shot, to achieve the requisite total package mass so long as they are placed so that the test results are not affected. Alternatively, in performing the drop test, the drop height may be varied in accordance with 9.7.3.4(b).

(b) Packagings should, in addition, have been successfully subjected to the leakproofness test at 30 kPa, with the results of this test reflected in the test report required by 9.7.8; and

(c) Packagings should be marked with the letter 'T' as described in 9.4.4."

9.7.2.5 Amend first sentence to read:

"Additional steps should be taken to ascertain that the plastics material used in the manufacture of plastics drums, plastics jerricans and composite packagings (plastics material) intended to contain liquids complies with the provisions in 9.3.2, 9.6.7.1 and 9.6.7.4."

9.7.3.1 In the first column of the table between "Steel jerricans" and "Plywood drums" insert "Aluminium jerricans"

9.7.3.2 Sub-paragraphs (a), (b), (c) remain unchanged.

Subparagraph (d): After "(see 9.6.18)", add "and".

Subparagraph (e): amend to read:

"Combination packagings with plastics inner packagings, other than plastics bags intended to contain solids or articles."

Subparagraphs (f), (g) and (h) to be deleted.

Remainder unchanged.

CHAPTER 10: SPECIAL RECOMMENDATIONS ON PACKING FOR CLASS 1

To be deleted.

Amend the heading to read:

"CHAPTER 10: (RESERVED)"

CHAPTER 11: SPECIAL RECOMMENDATIONS RELATING TO CLASS 5

Paragraph

11.2 Replace the text in sub-section 11.2 with the following:

11.2.1 *Assignment of substances to Division 5.1*

11.2.1.1 Oxidizing substances are classified in Division 5.1 in accordance with the test method, procedure and criteria in 11.2.2 and 11.2.3 (see also, Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, section 34). In the event of divergence between test results and known experience, judgement based on known experience should take precedence over test results.

11.2.1.2 Reclassification of existing entries should only be done for single substances and only where necessary for safety.

11.2.2 *Oxidizing solids*

11.2.2.1 Introduction

This test method is designed to measure the potential for a solid substance to increase the burning rate or burning intensity of a combustible substance when the two are thoroughly mixed. Tests are conducted on the substance to be evaluated mixed with dry fibrous cellulose in mixing ratios of 1:1 and 4:1, by mass, of sample to cellulose. The burning characteristics of the mixtures are compared with the standard 3:7 mixture, by mass, of potassium bromate to cellulose. If the burning time is equal to or less than this standard mixture, the burning times should be compared with those from the Packing Group I or II reference standards, 3:2 and 2:3 ratios, by mass, of potassium bromate to cellulose respectively.

11.2.2.2 Procedure

11.2.2.2.1 Technically pure potassium bromate is required as a reference substance. It should be sieved, but not ground, and the fraction with nominal particle sizes in the range 0.15 to 0.30 mm used as the reference substance. The reference substance is dried at 65°C to constant mass (for a minimum of 12 hours) and kept in a desiccator (with desiccant) until cool and required for use.

11.2.2.2.2 Dried fibrous cellulose */, with a fibre length between 50 and 250 μm and a mean diameter of 25 μm, is used as the combustible material. It is dried in a layer no more than 25 mm thick at 105°C to constant mass (for a minimum of 4 hours) and kept in a desiccator (with desiccant) until cool and required for use. The water content should be less than 0.5% by dry mass. If necessary, the drying time should be prolonged to achieve this.

Add the following footnote at the end of the page:

11.2.2.2.3 An ignition source is required comprising an inert metal wire (e.g. nickel/chromium) connected to an electrical power source and with the following characteristics:

(a) Length	=	30 ± 1 cm
(b) Diameter	=	0.6 ± 0.05 mm
(c) Electrical resistance	=	6.0 ± 0.5 Ω/m
(d) Electrical power dissipated in the wire	=	150 ± 7 W

The wire should be shaped as in figure 11.1.

11.2.2.2.4 A 60° glass funnel, sealed at the narrow end, with an internal diameter of 70 mm is required to form the mixtures into a truncated conical pile with base diameter of 70 mm on a cool, impervious, low heat conducting plate. A 150 mm by 150 mm plate with a thickness of 6 mm and a thermal conductivity (at a temperature of 0°C) of 0.23 $W.m^{-1}.K^{-1}$ is suitable. Other plates with a similar conductivity may be used.

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*/ Source reference available from the national contact for test details in France (see appendix 4 of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria).

11.2.2.2.5 A fume cupboard or other kind of ventilated area is required in which there is some ventilation but with an air stream velocity of 0.5 m/s or less. The fume extraction system should be suitable for the capture of toxic fumes.

11.2.2.2.6 The substance, in the form in which it will be transported, should be inspected for any particles of less than 500 μm diameter. If that powder constitutes more than 10% (mass) of the total, or if the substance is friable, then the whole of the test sample should be ground to a powder before testing to allow for a reduction in particle size during handling and transport.

11.2.2.2.7 30.0 g $\pm$ 0.1 g mixtures of the reference substance and cellulose are prepared in the potassium bromate to cellulose ratios of 3:7, 2:3 and 3:2, by mass. 30.0 g $\pm$ 0.1 g mixtures of the substance to be tested, in the particle size in which it will be transported, and cellulose are prepared in the oxidizer to cellulose ratios of 4:1 and 1:1, by mass. Each mixture should be mixed mechanically as thoroughly as possible without excessive stress. Each sample mixture should be made individually, used as soon as possible, and not taken from a batch.

11.2.2.2.8 Using the conical funnel, the mixture should be formed into a truncated conical pile, with a base diameter of 70 mm, covering the looped ignition wire resting on the low heat conducting plate. The plate should be placed in a ventilated area and the test performed at atmospheric pressure with the ambient temperature at 20°C $\pm$ 5°C.

11.2.2.2.9 Power is applied to the ignition wire and is maintained for the duration of the test or for three minutes if the mixture does not ignite and burn. The recorded burning time is from when the power is switched on to when the main reaction (e.g. flame, incandescence or glowing combustion) ends. Intermittent reaction, such as sparking or sputtering, after the main reaction should not be taken into account. If the heating wire breaks during the test then the test should be repeated unless breaking of the wire clearly does not effect the result. The test should be performed five times on the substance. Five tests should be performed with each reference mixture required to make the Packing Group assignment or to determine if the substance should not be classified in Division 5.1.

11.2.2.3 Criteria

11.2.2.3.1 The results are assessed on the basis of:

(a) the comparison of the mean burning time with those of the reference mixtures; and

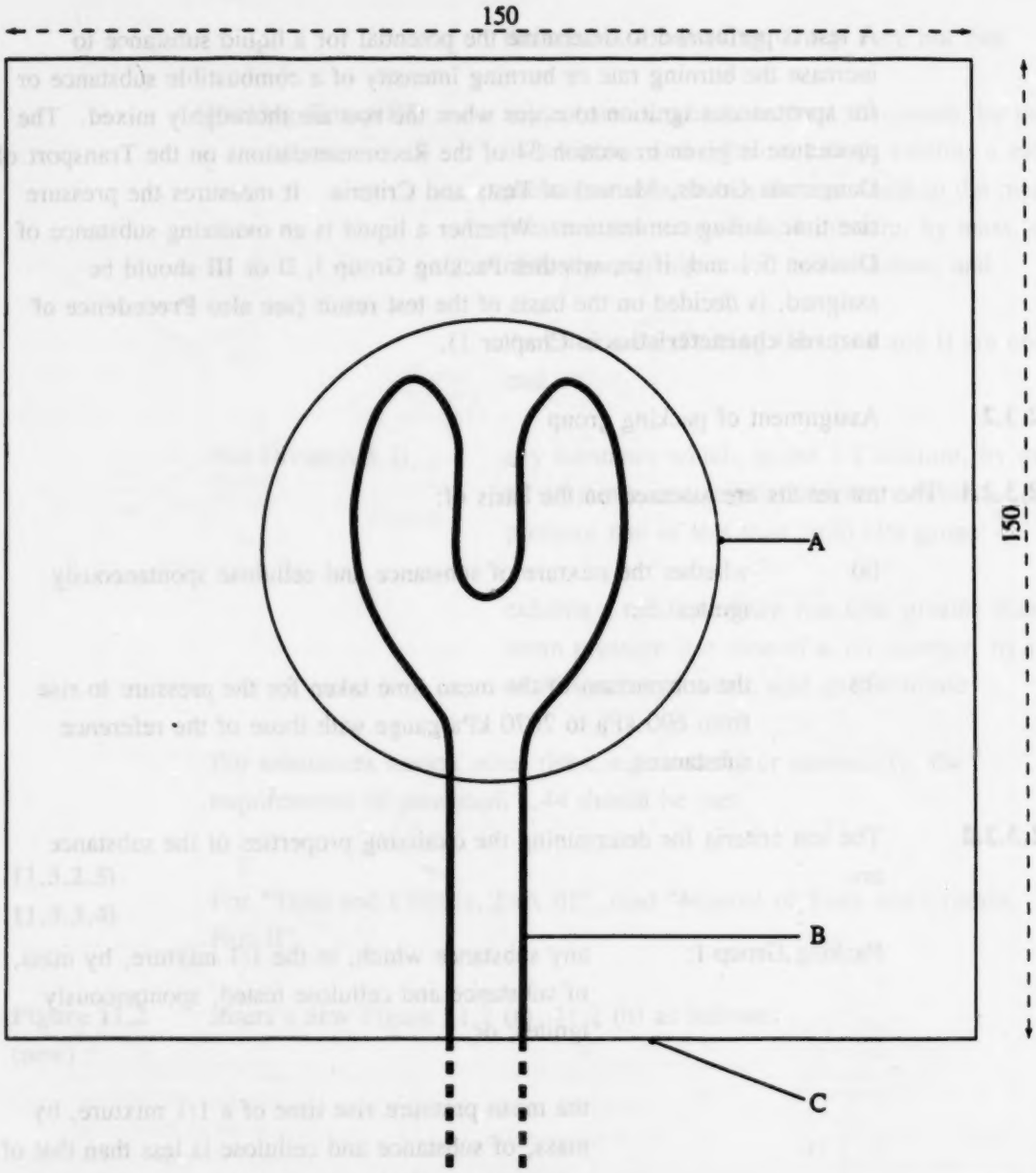
(b) whether the mixture of substance and cellulose ignites and burns.

11.2.2.3.2 The test criteria for determining oxidizing properties of the substance are:

Packing Group I	any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture, by mass, of potassium bromate and cellulose.
Packing Group II	any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose and the criteria for Packing Group I are not met.
Packing Group III	any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to are less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose and the criteria for Packing Groups I and II are not met.
Not Division 5.1	any substance which, in both the 4:1 and 1:1 sample-to-cellulose ratio (by mass) tested, does not ignite and burn, or exhibits mean burning times greater than that of a 3:7 mixture (by mass) of potassium bromate and cellulose.

For substances having other risks, e.g. toxicity or corrosivity, the requirements of paragraph 1.44 should be met.

Figure 11.1 Renumber existing Figure 11.1 as well as all references to Figure 11.1 in the text to Figure 11.2.
Insert a new Figure 11.1 as follows:



(A) Base of sample cone (70 mm diameter)
(B) Heating wire
(C) Low heat conducting plate

Figure 11.1: TEST PLATE AND IGNITION WIRE

11.2.3 *Oxidizing liquids*

11.2.3.1 Introduction

A test is performed to determine the potential for a liquid substance to increase the burning rate or burning intensity of a combustible substance or for spontaneous ignition to occur when the two are thoroughly mixed. The procedure is given in section 34 of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria. It measures the pressure rise time during combustion. Whether a liquid is an oxidizing substance of Division 5.1 and, if so, whether Packing Group I, II or III should be assigned, is decided on the basis of the test result (see also **Precedence of hazards characteristics** in Chapter 1).

11.2.3.2 Assignment of packing group

11.2.3.2.1 The test results are assessed on the basis of:

(a) whether the mixture of substance and cellulose spontaneously ignites.

(b) the comparison of the mean time taken for the pressure to rise from 690 kPa to 2070 kPa gauge with those of the reference substances.

11.2.3.2.2 The test criteria for determining the oxidizing properties of the substance are:

Packing Group I: any substance which, in the 1:1 mixture, by mass, of substance and cellulose tested, spontaneously ignites; or

the mean pressure rise time of a 1:1 mixture, by mass, of substance and cellulose is less than that of a 1:1 mixture, by mass, of 50% perchloric acid and cellulose.

Packing Group II: any substance which, in the 1:1 mixture, by mass, of substance and cellulose tested, exhibits a mean

pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of 40% aqueous sodium chlorate solution and cellulose; and

the criteria for Packing Group I are not met.

Packing Group III: any substance which, in the 1:1 mixture, by mass, of substance and cellulose tested, exhibits a mean pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of 65% aqueous nitric acid and cellulose; and

the criteria for Packing Groups I and II are not met.

Not Division 5.1: any substance which, in the 1:1 mixture, by mass, of substance and cellulose tested, exhibits a pressure rise of less than 2070 kPa gauge; or

exhibits a mean pressure rise time greater than the mean pressure rise time of a 1:1 mixture, by mass, of 65% aqueous nitric acid and cellulose.

For substances having other risks, e.g. toxicity or corrosivity, the requirements of paragraph 1.44 should be met.

11.3.2.5)
11.3.3.4) For "Tests and Criteria, Part III", read "Manual of Tests and Criteria, Part II".

Figure 11.2 (new) Insert a new Figure 11.2 (a), 11.2 (b) as follows:

Figure 11.2 (a): FLOW CHART SCHEME FOR ORGANIC PEROXIDES

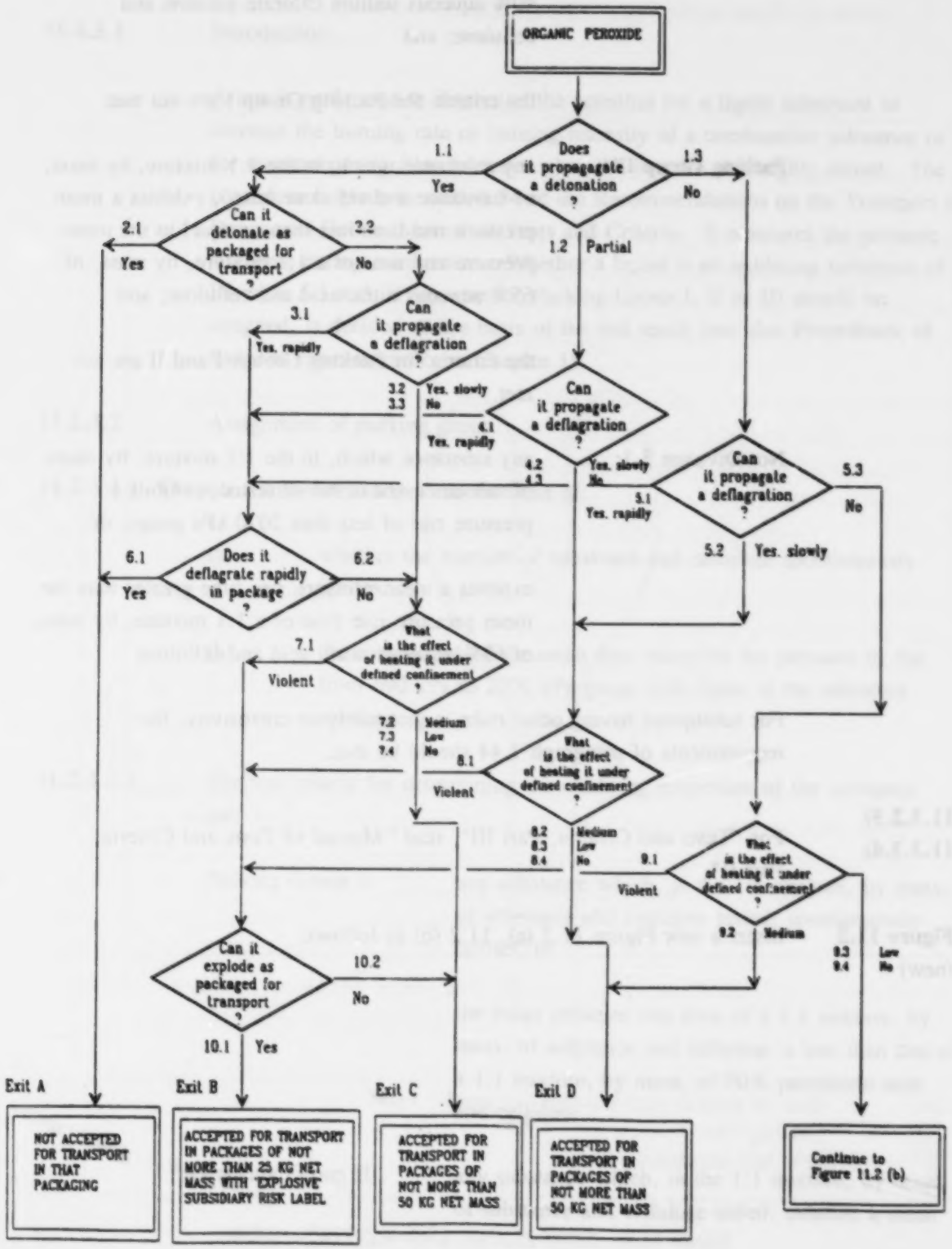
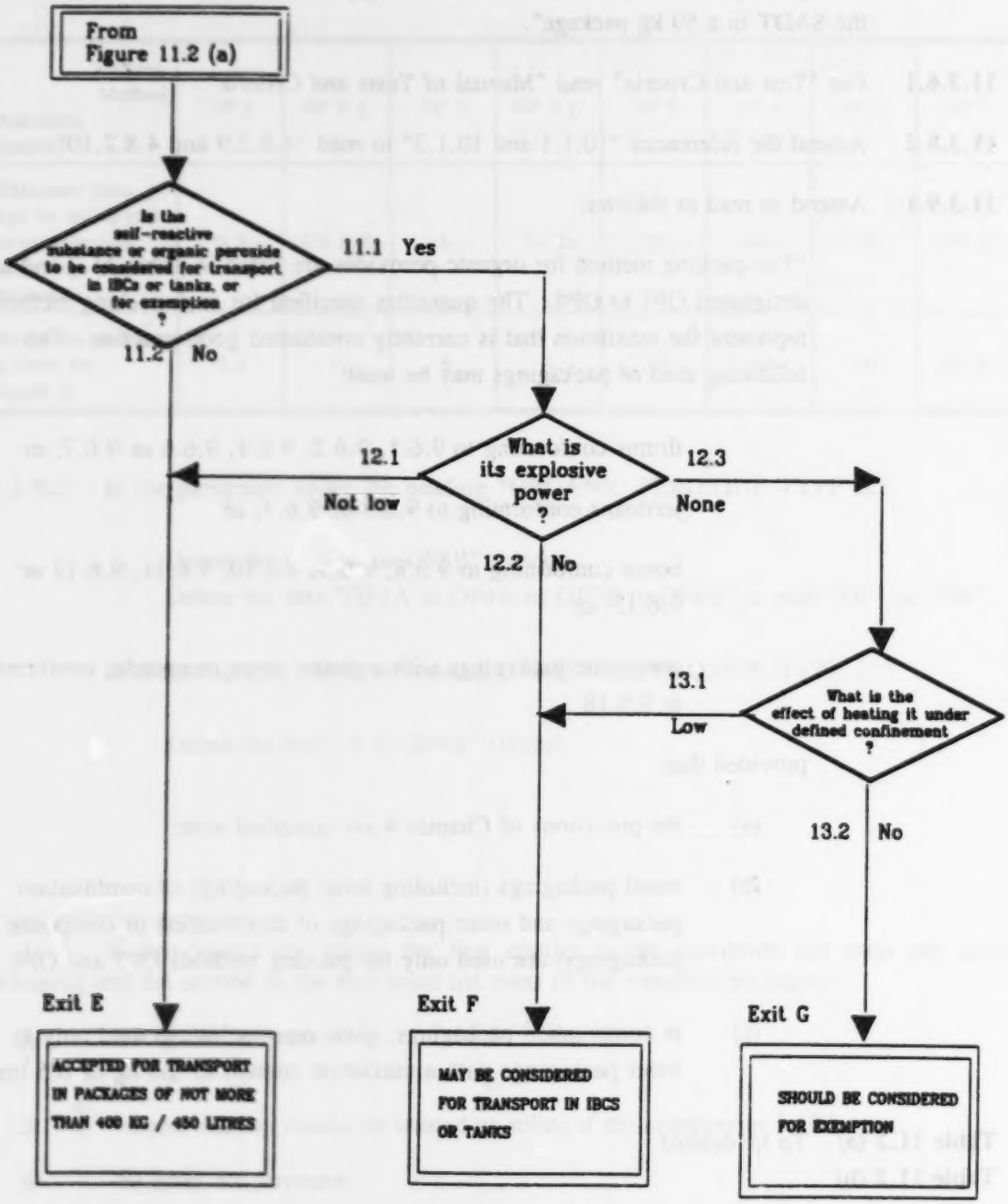

ORGANIC PEROXIDE
Does it propagate a detonation ?
1.1 Yes
1.3 No
1.2 Partial
Can it detonate as packaged for transport ?
2.1 Yes
2.2 No
Can it propagate a deflagration ?
3.1 Yes, rapidly
3.2 Yes, slowly
3.3 No
Can it propagate a deflagration ?
4.1 Yes, rapidly
4.2 Yes, slowly
4.3 No
Can it propagate a deflagration ?
5.1 Yes, rapidly
5.2 Yes, slowly
5.3 No
Does it deflagrate rapidly in package ?
6.1 Yes
6.2 No
What is the effect of heating it under defined confinement ?
7.1 Violent
7.2 Medium
7.3 Low
7.4 No
What is the effect of heating it under defined confinement ?
8.1 Violent
8.2 Medium
8.3 Low
8.4 No
What is the effect of heating it under defined confinement ?
9.1 Violent
9.2 Medium
9.3 Low
9.4 No
Can it explode as packaged for transport ?
10.1 Yes
10.2 No
Exit A
NOT ACCEPTED FOR TRANSPORT IN THAT PACKAGING
Exit B
ACCEPTED FOR TRANSPORT IN PACKAGES OF NOT MORE THAN 25 KG NET MASS WITH "EXPLOSIVE" SUBSIDIARY RISK LABEL
Exit C
ACCEPTED FOR TRANSPORT IN PACKAGES OF NOT MORE THAN 50 KG NET MASS
Exit D
ACCEPTED FOR TRANSPORT IN PACKAGES OF NOT MORE THAN 50 KG NET MASS
Continue to Figure 11.2 (b)

Figure 11.2 (b): FLOW CHART SCHEME FOR ORGANIC PEROXIDES (cont'd)


From Figure 11.2 (a)
Is the self-reactive substance or organic peroxide to be considered for transport in IBCs or tanks, or for exemption ?
11.1 Yes
11.2 No
What is its explosive power ?
12.1 Not low
12.3 None
12.2 No
What is the effect of heating it under defined confinement ?
13.1 Low
13.2 No
Exit E
ACCEPTED FOR TRANSPORT IN PACKAGES OF NOT MORE THAN 400 KG / 450 LITRES
Exit F
MAY BE CONSIDERED FOR TRANSPORT IN IBCS OR TANKS
Exit G
SHOULD BE CONSIDERED FOR EXEMPTION

11.3.4.1 Amend the words "in case of spillage" to read as "in case of spillage or fire"

11.3.4.2 Replace last two sentences by "Type B diluents may be used for desensitization of all organic peroxides provided that the boiling point is at least 60 °C higher than the SADT in a 50 kg package".

11.3.6.1 For "Test and Criteria" read "Manual of Tests and Criteria".

11.3.8.2 Amend the references "10.1.1 and 10.1.3" to read "4.8.2.9 and 4.8.2.10"

11.3.9.1 Amend to read as follows:

"The packing method for organic peroxides are listed in Table 11.2 and are designated OP1 to OP8. The quantities specified for each packing method represent the maximum that is currently considered good practice. The following kind of packagings may be used:

- drums conforming to 9.6.1, 9.6.2, 9.6.4, 9.6.6 or 9.6.7; or
- jerricans conforming to 9.6.3 or 9.6.7; or
- boxes conforming to 9.6.8, 9.6.9, 9.6.10, 9.6.11, 9.6.12 or 9.6.13; or
- composite packagings with a plastic inner receptacle, conforming to 9.6.18

provided that:

(a) the provisions of Chapter 9 are complied with;

(b) metal packagings (including inner packagings of combination packagings and outer packagings of combination or composite packagings) are used only for packing methods OP7 and OP8;

(c) in combination packagings, glass receptacles are used only as inner packagings with a maximum content of 0.5 kg or 0.5 litre.

Table 11.2 (a) To be deleted

Table 11.2 (b)

Insert a new Table 11.2 as follows:

Table 11.2 MAXIMUM QUANTITY PER PACKAGING / PACKAGE 1/ FOR PACKING METHODS OP1 TO OP8

Packing Method / Maximum Quantity	OP 1	OP 2 1/	OP 3	OP 4 1/	OP 5	OP 6	OP 7	OP 8
Maximum mass (kg) for solids and for combination packagings (liquid and solid)	0.5	0.5 / 10	5	5 / 25	25	50	50	200 2/
Maximum contents in litres for liquids 3/	0.5	--	5	--	30	60	60	225 4/

11.3.9.3 In the paragraph under the heading "ORGANIC PEROXIDE TYPE B:"

Delete the text "A or OP5B" (twice).
Delete the text "OP1A to OP4A or OP1B to OP4B" to read "OP1 to OP4".

In the paragraph under the heading "ORGANIC PEROXIDE TYPE C:"

Delete the text "A or OP6B" (twice).

1/ If two values are given, the first applies to the maximum net mass per inner packaging and the second to the maximum net mass of the complete package.

2/ 60 kg for jerricans
100 kg for boxes

3/ Viscous liquids should be treated as solids if the criterion in 1.10 is met.

4/ 60 litres for jerricans.

In the paragraph under the heading "ORGANIC PEROXIDE TYPE D:"

Delete the text "A or OP7B".

In the paragraphs under the headings "ORGANIC PEROXIDE TYPE E:" and "ORGANIC PEROXIDE TYPE E:"

Delete the text "A or OP8B".

Table 11.3

In the column "Packing Method" delete the letters "A" and "B" wherever they appear.

Add the following new entries into the table:

ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%) 1)	Inert solid (%)	Water (%)	Packing Method	Control Temperature (°C)	Emergency Temperature (°C)	Number (Generic entry)	Subsidiary risks and remarks
CUMYL PEROXYNEODECANOATE	≤ 52 as a stable dispersion in water					OP8	- 10	0	3119	
DIBENZOYL PEROXIDE	≤ 42 as a stable dispersion in water					OP8, N			3109	
DI-n-BUTYL PEROXYDICARBONATE	≤ 42 as a stable dispersion in water(frozen)					OP8	- 15	- 5	3118	
1,1-DI-(tert-BUTYLPEROXY) CYCLOHEXANE	≤ 42	≥ 58				OP8, N			3109	
2,4,4-TRIMETHYLPENTYL-2-PEROXY-NEODECANOATE	≤ 52 as a stable dispersion in water					OP8	- 5	+ 5	3119	
ISOPROPYL sec-BUTYL PEROXYDICARBONATE + DI-sec-BUTYL PEROXYDICARBONATE + DI-ISOPROPYL PEROXYDICARBONATE	≤52 + ≤28 + ≤22					OP5	- 20	- 10	3111	
tert-AMYL PEROXYACETATE	≤ 62	≥ 38				OP8			3107	
tert-AMYL PEROXY-2-ETHYLHEXYL CARBONATE	≤ 100					OP7			3105	
n-BUTYL-4,4-DI-(tert-BUTYLPEROXY) VALERATE	≤ 42			≥ 58		OP8			3108	
tert-BUTYL PEROXYACETATE	≤ 22		≥ 78			OP8			3109	25)
tert-BUTYL PEROXYNEOHEPTANOATE	≤ 77	≥ 23				OP7	+ 5	+ 10	3115	
CUMYL PEROXYNEOHEPTANOATE	≤ 77	≥ 23				OP7	- 10	+ 0	3115	
1,1-DI-(tert-AMYLPEROXY) CYCLOHEXANE	≤ 82	≥ 18				OP6			3103	
DIBENZOYL PEROXIDE	≤ 56.5 as a paste				≥ 15	OP8			3108	

ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%) 1)	Inert solid (%)	Water (%)	Packing Method	Control Temperature (°C)	Emergency Temperature (°C)	Number (Generic entry)	Subsidiary risks and remarks
1,1-DI-(tert-BUTYLPEROXY) CYCLOHEXANE	≤ 13	≥ 13	≥ 74			OP8			3109	
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYLCYCLOHEXANE	≤ 32	≥ 26	≥ 42			OP8			3107	
DICUMYL PEROXIDE	≤ 52	≥ 48							EXEMPT	
1,1-DIMETHYL-3-HYDROXYBUTYL PEROXYNEOHEPTANOATE	≤ 52	≥ 48				OP8	0	+ 10	3117	

Change entries in the table as follows:

ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%) 1)	Inert solid (%)	Water (%)	Packing Method	Control Temperature (°C)	Emergency Temperature (°C)	Number (Generic entry)	Subsidiary risks and remarks
1,1-DI-(tert-BUTYLPEROXY) CYCLOHEXANE	≤ 52	≥ 48				OP7A			3105	
to be changed to										
1,1-DI-(tert-BUTYLPEROXY) CYCLOHEXANE	> 42 - 52	≥ 48				OP7			3105	
PEROXYACETIC ACID, TYPE F, stabilized	≤ 43					OP8A			3109	13) 16) 19)
to be changed to:										
PEROXYACETIC ACID, TYPE F, stabilized	≤ 43					OP8, N			3109	13) 16) 19)

ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%) 1)	Inert solid (%)	Water (%)	Packing Method	Control Temperature (°C)	Emergency Temperature (°C)	Number (Generic entry)	Subsidiary risks and remarks
3-CHLOROPEROXYBENZOIC ACID	≤ 72			≥ 10	≥ 18	OP7B			3106	
to be changed to: 3-CHLOROPEROXYBENZOIC ACID	≤ 77			≥ 6	≥ 17	OP7			3106	
DI-tert-BUTYL PEROXIDE	≤ 32	≥ 68				OP8A, N, M			3109	
to be changed to: DI-tert-BUTYL PEROXIDE	≤ 52		≥ 48			OP8, N, M		3109	25)	
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE	≤ 42 as a stable dispersion in water					OP8A	- 15	- 5	3117	
to be changed to: DI-(2-ETHYLHEXYL) PEROXYDICARBONATE	≤ 52 as a stable dispersion in water					OP8	- 15	- 5	3119	
2,5-DIMETHYL-2,5-DI-(tert-BUTYLPEROXY)HEXYNE-3	> 52 - 100					OP5A			3103	
to be changed to: 2,5-DIMETHYL-2,5-DI-(tert-BUTYLPEROXY)HEXYNE-3	> 52 - 86	≥ 14				OP5			3103	26)
p-MENTHYL HYDROPEROXIDE	56 - 100					OP7A			3105	13)
	< 56	> 44				OP8A, M			3109	
to be changed to: p-MENTHYL HYDROPEROXIDE	>72 - 100					OP7			3105	13)
	≤ 72	≥ 28				OP8, M			3109	27)

Add the following notes to the table:

25) Diluent type B with boiling point > 110 °C

26) With < 0.5% hydroperoxides content.

27) For concentrations more than 56% "CORROSIVE" subsidiary risk label required (Model No 08, see 13.5)

Table 11.4: Add the following new entries:

UN No.	Organic peroxide	Type of IBC 1/	Maximum quantity (litres)	Control Temperature	Emergency Temperature
3109	ORGANIC PEROXIDES, TYPE F, LIQUID				
	Peroxyacetic acid, stabilized, not more than 17%	31H1	1000		
	Dibenzoyl peroxide, not more than 42% as a stable dispersion	31H1	1000		
	1,1-Di-(tert-butylperoxy) cyclohexane, not more than 42% in diluent type A	31H1	1000		
	tert-Butyl peroxyacetate, not more than 32% in diluent type A	31A	1250		
	tert-Butyl peroxy-3,5,5-trimethylhexanoate, not more than 32% in diluent type A	31A	1250		
	Di-tert-butyl peroxide, not more than 32% in diluent type A	31A	1250		
	Cumyl hydroperoxide, not more than 90% in diluent type A	31HA1	1250		
	Isopropyl cumyl hydroperoxide, not more than 72% in diluent type A	31HA1	1250		
	p-Menthyl hydroperoxide, not more than 72% in diluent type A	31HA1	1250		
3119	ORGANIC PEROXIDES, TYPE F, LIQUID, TEMPERATURE CONTROLLED				
	tert-Butyl peroxy-2-ethylhexanoate, not more than 32% in diluent type B	31A	1250	+ 30 °C	+ 35 °C
	tert-Butyl peroxypivalate, not more than 27% in diluent type B	31A	1250	+ 10 °C	+ 15 °C
	Di-(3,5,5-trimethylhexanoyl) peroxide, not more than 38% in diluent type A	31A	1250	+ 10 °C	+ 15 °C

1/ See 16.5, bottom openings allowed.

Table 11.5 **Change as follows:**

UN NO.	ORGANIC PEROXIDE	Control Temperature	Emergency Temperature
3109	ORGANIC PEROXIDES, TYPE F, LIQUID p-Menthyl hydroperoxide, less than 56% in diluent type A **to be changed to** p-Menthyl hydroperoxide, not more than 72% in diluent type A		

11.3.13.1 After the existing text insert: "; special requirements are given in section 12.550."

CHAPTER 12: RECOMMENDATIONS ON MULTIMODAL TANK TRANSPORT

1. Changes to paragraphs

12.558 Insert the following note after the paragraph:

Note: An example of a method to determine the size of emergency-relief devices is given in Appendix 5 of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria.

12.700-
12.703 The decimal points in the paragraph numbers should be added (english version only).

2. Amend Table 12.1 in accordance with amendments adopted for Chapter 2 and as follows:

(a) Amend entries as follows:

For the entry UN 1082:
replace in column (3) "2.1" with "2.3"
add "2.1" in column (4)
replace in column (6) "Allowed" with "Not Allowed"
replace in column (7) "Normal" with "12.30.3"

For the entry UN 3252 delete the existing pressures in column (5) and replace with the following:

(5) "43.0
39.0
34.4
30.5"

(b) Add the following new entry:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3318	Ammonia solution, relative density less than 0.880 at 15 °C in water, with more than 50 % ammonia	2.3	8	See 12.24.6	Allowed	12.30.3	See 12.40	

3. Amend Table 12.2 in accordance with amendments adopted for Chapter 2 and as follows:

(a) At the beginning:

In (b) amend the text "2,5, or 6" to read "(2), (5) or (6)".

Add a note 14 to read:

"Temperature should be maintained between 18 °C and 40 °C. Tanks containing solidified methacrylic acid should not be reheated during transport."

(b) Amend entries as follows:

UN 1224) Delete superscript "4" after the name.
UN 1987)

UN 1600 Amend the name to read: "Dinitrotoluenes, molten"

UN 2531 Add superscript 14 after the name

UN 2644 Add superscript "9" after the name.

UN 2912 Change in the name the word "LSA" to "LSA-I" and delete ",n.o.s.".

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1199	Furaldehydes	6.1/II	3	2.65	12.5.2	A/12.7.3	N.	12.22.3
1251	Methyl vinyl ketone, stabilised 9/	6.1/I	3 8	4	6 mm	N.A.	12.9.3	12.22.3
1695	Chloroacetone, stabilised 9/	6.1/I	3 8	6	8 mm	N.A.	12.9.3	12.22.3
1809	Phosphorus trichloride 9/	6.1/I	8	4	6 mm	N.A.	12.9.3	12.22.3
2295	Methyl chloroacetate 9/	6.1/I	3	4	12.5.2	N.A.	12.9.3	12.22.3
2477	Methyl isothiocyanate 9/	6.1/I	3	4	6 mm	N.A.	12.9.3	12.22.3
2487	Phenyl isocyanate 9/	6.1/I	3	4	6 mm	N.A.	12.9.3	12.22.3
2488	Cyclohexyl isocyanate 9/	6.1/I	3	4	6 mm	N.A.	12.9.3	12.22.3
2542	Tributylamine	6.1/II	-	2.65	12.5.2	A/12.7.3	N.	12.22.3
2644	Methyl iodide	6.1/I	-	4	12.5.2	N.A.	12.9.3	12.22.3
2686	2-Diethylaminoethanol	8/II	3	2.65	12.5.2	A/12.7.3	N.	12.22.3
2801	Dye, liquid, corrosive, n.o.s. or Dye intermediate, liquid corrosive, n.o.s.	8/I	-	4	12.5.2	A/12.7.3	N.	12.22.3
		8/II		4	12.5.2	A/12.7.3	N.	12.22.3
		8/III		2.65	12.5.2	A/12.7.3	N.	12.22.2
3023	2-Methyl-2-heptanethiol 9/	6.1/I	3	4	6 mm	N.A.	12.9.3	12.22.3

(c) Add the following new entries:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1990	Benzaldehyde	9/III	-	1.5	12.5.2	A/12/7.2	N.	12.22.2
3302	2-Dimethylaminoethyl acrylate	6.1/II	-	2.65	12.5.2	A/12/7/3	N.	12.22.3
3320	Sodium borohydride and sodium hydroxide solution, with not more than 12% sodium borohydride and not more than 40% sodium hydroxide by mass	8/184	-	4	6 mm	A/12/7/3	12.9.3	12.22.3

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3321	Radioactive material, low specific activity (LSA-II), non fissile or fissile-excepted	7	-	2.65	12.5.2	N.A.	12.9.3	12.703
3322	Radioactive material, low specific activity (LSA-III), non fissile or fissile-excepted	7	-	2.65	12.5.2	N.A.	12.9.3	12.703

CHAPTER 13: RECOMMENDATIONS ON CONSIGNMENT PROCEDURES

Paragraph

13.2.1 In the example-marking after "liquid," insert " acidic, organic," and replace "UN 1760" by "UN 3265"

13.2.2 Replace at the end "9.5 and 16.1.5" by "9.5, 16.1.5 and, for infectious substances, in 6.13.5".

13.3.1 (c) Amend the end to read:

".....handling, stowage and segregation."

Figure 13.4 : Add "(4) supplemented by the words 'SALVAGE PACKAGE'"

13.8.3.1 In (a) replace "UN 1011" by "UN 1057" and "BUTANE" by "LIGHTERS" (twice) and "BUTANE MIXTURE" by "LIGHTER REFILLS" (twice).

13.10 (new) Insert a new section 13.10 to read as follows:

"13.10 **Salvage packagings**

Salvage packagings should be marked with the proper shipping name and UN number of, and bear all labels prescribed for, the dangerous goods contained therein and in addition, should be marked with the word 'SALVAGE'. The words "SALVAGE PACKAGE" should be added after the description of the goods in the dangerous goods transport document required by 13.6."

Existing section 13.10 is renumbered to 13.11.

13.12 (new) Add a new section 13.12 to read:

"**13.12 Segregation of dangerous goods**

13.12.1 Incompatible goods should be segregated from one another during transport. For the purpose of segregation, two substances or articles are considered mutually incompatible when their stowing together may result in undue hazards in the case of leakage, spillage, or any other accident. In this regard, detailed segregation requirements for substances and articles of class 1 are provided in Chapter 4.

13.12.2 The extent of the hazard arising from possible reactions between incompatible dangerous goods may vary and the segregation arrangements required should also vary as appropriate. In some instances such segregation may be obtained by requiring certain distances between incompatible dangerous goods. Intervening spaces between such dangerous goods may be filled with cargo compatible with the dangerous substances or articles in question.

13.12.3 The provisions of the Recommendations are general in nature. The segregation requirements for each particular mode of transport should be based on the following principles:

13.12.3.1 Incompatible dangerous goods should be segregated from one another so as to effectively minimize hazards in the event of accidental leakage or spillage or any other accident.

13.12.3.2 Whenever dangerous goods are stowed together, the most stringent segregation requirements for any of the goods should be applied.

13.12.3.3 For packages required to bear a subsidiary risk label, the segregation appropriate to the subsidiary hazard should be applied when it is more stringent than that required by the primary hazard."

CHAPTER 14: SPECIAL RECOMMENDATIONS RELATING TO CLASS 4

1. Amend as follows:

Paragraph

14.1.2 Append "and also in the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, section 33."

14.2.1.2.1)

14.2.1.3.1) Insert after "in 14.5.2" the test manual reference "(and in the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 33.2.1)".

14.2.1.4.1 (b)

Replace "1347" with "1437".

Delete the reference to "UN 2623 FIRELIGHTERS, SOLID with flammable liquid".

14.2.1.4.2 (f) Replace the existing text under the reference to "UN 2623 FIRELIGHTERS, SOLID with flammable liquid" with the following text: "These products are designed to burn in a controlled manner".

14.2.2.3.1 In the last sentence, insert "UN 3241,"

14.2.2.3.3 Amend "Tests and Criteria, Part III" to read "Manual of Tests and Criteria, Part II".

14.2.2.3.5 In the second indented paragraph delete the text "A or OP2B".

14.2.2.4.3 Delete the words "for organic peroxides," and at the end, read "Manual of Tests and Criteria, Part II".

Figure 14.2 Delete

Insert a new Figure 14.2(a), 14.2(b) as follows:

Figure 14.2 (a): FLOW CHART SCHEME FOR SELF-REACTIVE SUBSTANCES

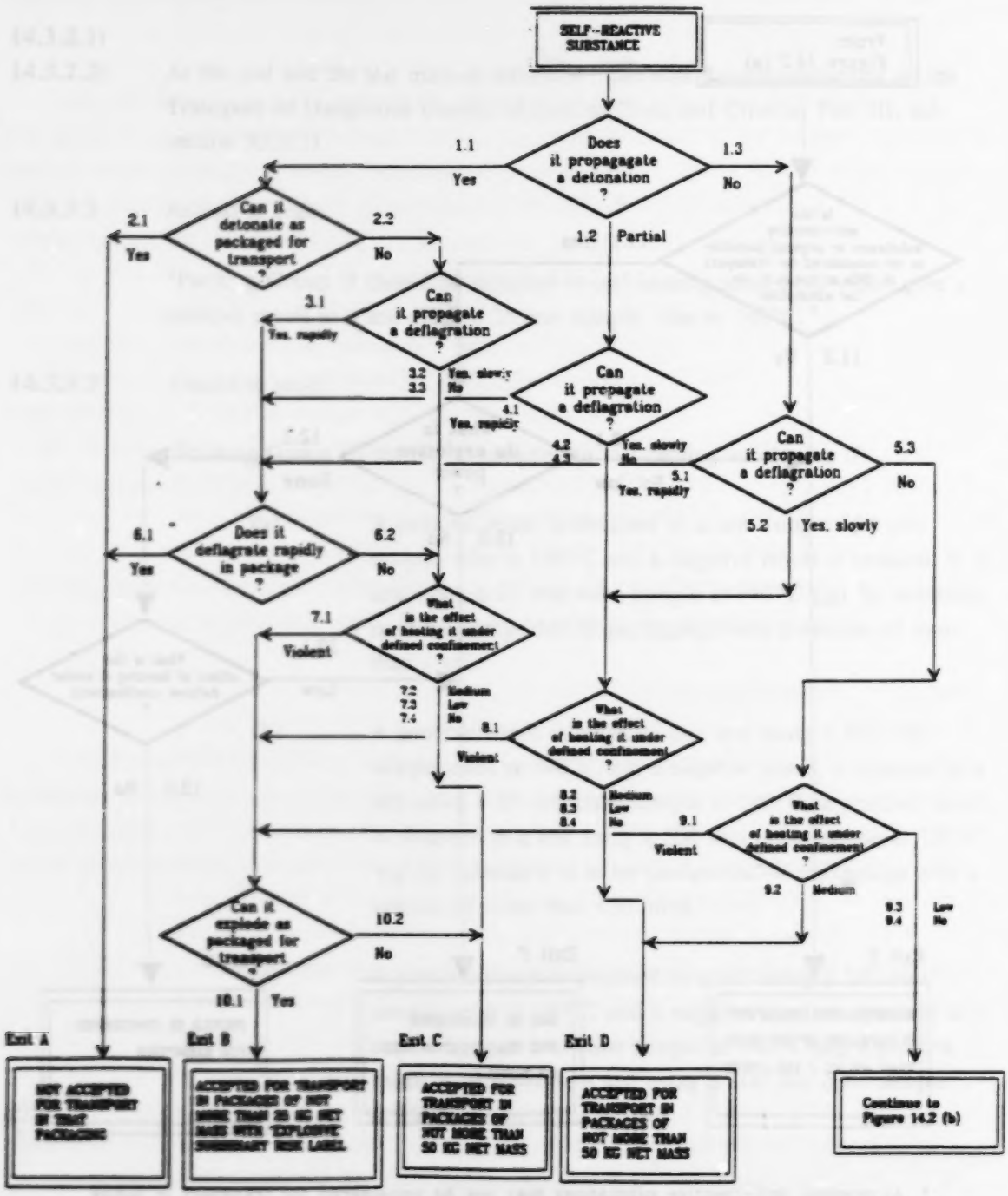
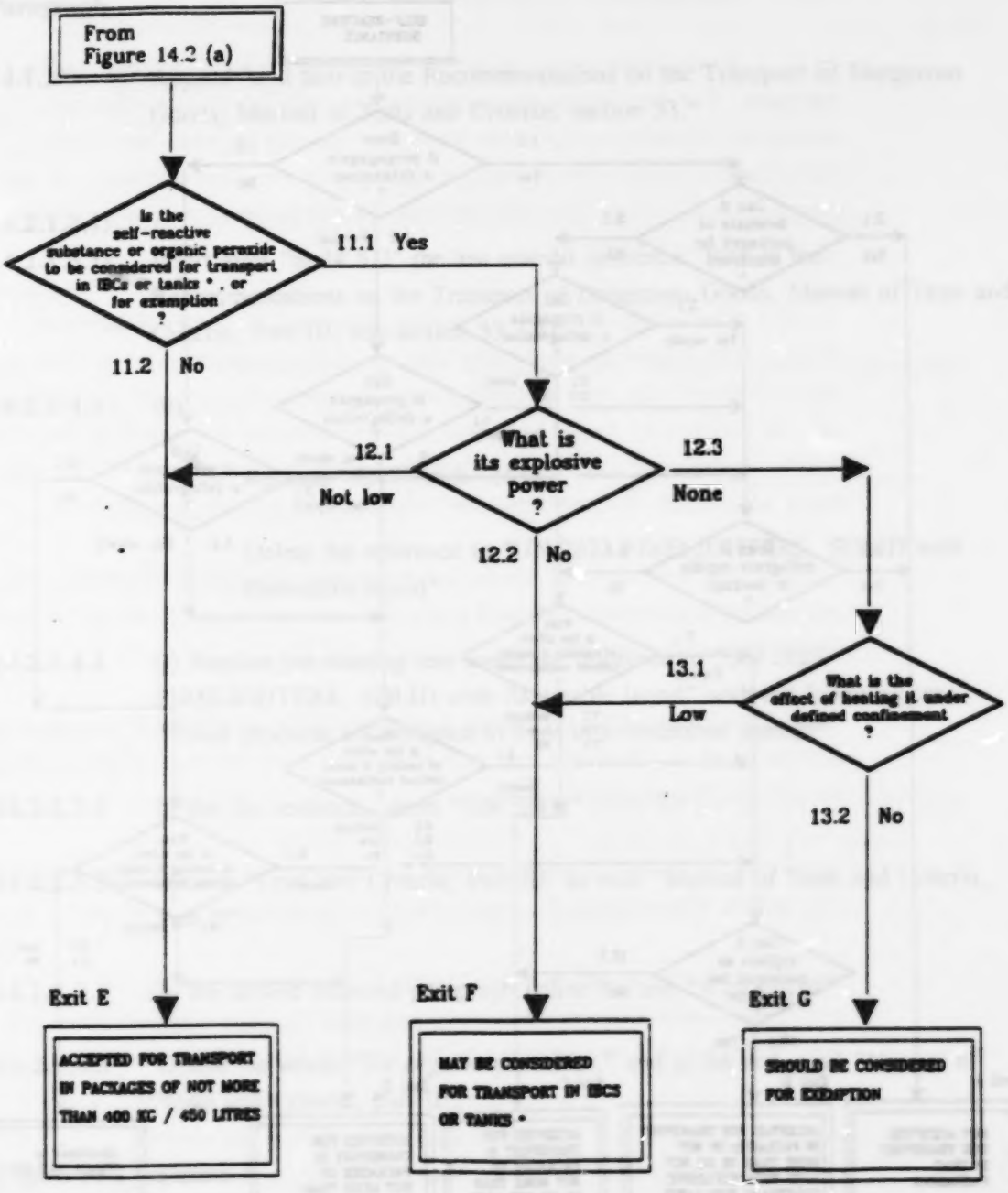

SELF-REACTIVE SUBSTANCE
Does it propagate a detonation ?
1.1 Yes
1.2 Partial
1.3 No
Can it detonate as packaged for transport ?
2.1 Yes
2.2 No
Can it propagate a deflagration ?
3.1 Yes, rapidly
3.2 Yes, slowly
3.3 No
Can it propagate a deflagration ?
4.1 Yes, rapidly
4.2 Yes, slowly
4.3 No
Can it propagate a deflagration ?
5.1 Yes, rapidly
5.2 Yes, slowly
5.3 No
Does it deflagrate rapidly in package ?
6.1 Yes
6.2 No
What is the effect of heating it under defined confinement ?
7.1 Violent
7.2 Medium
7.3 Low
7.4 No
What is the effect of heating it under defined confinement ?
8.1 Violent
8.2 Medium
8.3 Low
8.4 No
What is the effect of heating it under defined confinement ?
9.1 Violent
9.2 Medium
9.3 Low
9.4 No
Can it explode as packaged for transport ?
10.1 Yes
10.2 No
Exit A
NOT ACCEPTED FOR TRANSPORT IN THAT PACKAGING
Exit B
ACCEPTED FOR TRANSPORT IN PACKAGES OF NOT MORE THAN 25 KG NET MASS WITH "EXPLOSIVE SUBSIDIARY RISK LABEL
Exit C
ACCEPTED FOR TRANSPORT IN PACKAGES OF NOT MORE THAN 50 KG NET MASS
Exit D
ACCEPTED FOR TRANSPORT IN PACKAGES OF NOT MORE THAN 50 KG NET MASS
Continue to Figure 14.2 (b)

Figure 14.2 (b): FLOW CHART SCHEME FOR SELF-REACTIVE SUBSTANCES (cont'd)


From Figure 14.2 (a)
Is the self-reactive substance or organic peroxide to be considered for transport in IBCs or tanks *, or for exemption ?
11.1 Yes
11.2 No
What is its explosive power ?
12.1 Not low
12.3 None
12.2 No
What is the effect of heating it under defined confinement ?
13.1 Low
13.2 No
Exit E
ACCEPTED FOR TRANSPORT IN PACKAGES OF NOT MORE THAN 400 KG / 450 LITRES
Exit F
MAY BE CONSIDERED FOR TRANSPORT IN IBCS OR TANKS *
Exit G
SHOULD BE CONSIDERED FOR EXEMPTION

* At present, self-reactive substances may not be considered for transport in tanks

14.2.2.7.3 Amend the references "10.1.1 and 10.1.3" to read "4.8.2.9 and 4.8.2.10"

14.2.3.1 On the last line of the paragraph amend the words "2907 and 3270" to read "2907, 3270 and 3319"

14.3.2.1)
14.3.2.2) At the end add the test manual reference "(see also Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 33.3.1).

14.3.3.2 Amend to read:

"Packing Group II should be assigned to self-heating substances which give a positive result in a test using a 25 mm sample cube at 140°C.

14.3.3.3 Amend to read:

"Packing Group III should be assigned to self-heating substances if:

(a) A positive result is obtained in a test using a 100 mm sample cube at 140°C and a negative result is obtained in a test using a 25 mm cube sample at 140°C and the substance is to be transported in packagings with a volume of more than 3 m^3.

(b) A positive result is obtained in a test using a 100 mm sample cube at 140°C and a negative result is obtained in a test using a 25 mm cube sample at 140°C, a positive result is obtained in a test using a 100 mm cube sample at 120°C and the substance is to be transported in packagings with a volume of more than 450 litres.

(c) A positive result is obtained in a test using a 100 mm sample cube at 140°C and a negative result is obtained in a test using a 25 mm cube sample at 140°C and a positive result is obtained in a test using a 100 mm cube sample at 100°C."

14.3.3.4 Add a new marginal 14.3.3.4 as follows:

"14.3.3.4 A substance should not be classified in Division 4.2 if:

(a) A negative result is obtained in a test using a 100 mm cube sample at 140°C.

(b) A positive result is obtained in a test using a 100 mm sample cube at 140°C and a negative result is obtained in a test using a 25 mm cube sample at 140°C, a negative result is obtained in a test using a 100 mm cube sample at 120°C and the substance is to be transported in packagings with a volume not more than 3 m^3.

(c) A positive result is obtained in a test using a 100 mm sample cube at 140°C and a negative result is obtained in a test using a 25 mm cube sample at 140°C, a negative result is obtained in a test using a 100 mm cube sample at 100°C and the substance is to be transported in packagings with a volume not more than 450 litres."

14.4.2.1 Insert after "14.5.6" the text "see also Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, sub-section 33.4.1)".

14.5.1.2 Amend to read:

"The test methods and criteria for Class 4 are also given, with advice on application of the tests, in the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, section 33. Test methods and criteria for self-reactive substances are given in Part II of the Manual of Tests and Criteria."

14.5.2 Replace the text of sub-section 14.5.2 with the following:

"14.5.2.1 Preliminary screening test

The substance in its commercial form, should be formed into an unbroken strip or powder train about 250 mm long by 20 mm wide by 10 mm high on a cool, impervious, low heat-conducting base plate. A hot flame (minimum

temperature 1000°C) from a gas burner (minimum diameter 5 mm) should be applied to one end of the powder train until the powder ignites or for a maximum of 2 minutes (5 minutes for powders of metals or metal-alloys). It should be noted whether combustion propagates along 200 mm of the train within the 2 minute test period (or 20 minutes for metal powders). If the substance does not ignite and propagate combustion either by burning with flame or smouldering along 200 mm of the powder train within the 2 minute (or 20 minute) test period, then the substance should not be classified as a flammable solid and no further testing is required. If the substance propagates burning of a 200 mm length of the powder train in less than 2 minutes or less than 20 minutes for metal powders, the full test programme in 14.5.2.2 should be carried out.

14.5.2.2 Burning rate test

14.5.2.2.1 Procedure

14.5.2.2.1.1 A mould 250 mm long with a triangular cross-section of inner height 10 mm and width 20 mm is used to form the train for the burning rate test. On both sides of the mould, in the longitudinal direction, two metal sheets are mounted as lateral limitations which extend 2 mm beyond the upper edge of the triangular cross-section (figure 14.3). An impervious, non-combustible, low heat-conducting plate is used to support the sample train.

14.5.2.2.1.2 The powdered or granular substance, in its commercial form, should be loosely filled into the mould. The mould is then dropped three times from a height of 20 mm onto a solid surface. The lateral limitations are then removed and the impervious, non-combustible, low heat-conducting plate is placed on top of the mould, the apparatus inverted and the mould removed. Pasty substances are spread on a non-combustible surface in the form of a rope 250 mm in length with a cross-section of about 100 mm^2. In the case of a moisture sensitive substance, the test should be carried out as quickly as possible after its removal from the container. The pile should be arranged across the draught in a fume cupboard. The air speed should be sufficient to prevent fumes escaping into the laboratory and should not be varied during the test. A draught screen may be erected around the apparatus.

14.5.2.2.1.3 For substances other than metal powders, 1 ml of a wetting solution should be added to the pile 30 - 40 mm beyond the 100 mm timing

zone. Apply the wetting solution to the ridge drop by drop, ensuring the whole cross-section of the pile is wetted without loss of liquid from the sides. The liquid should be applied over the shortest possible length of the pile consistent with avoiding loss from the sides. With many substances, water rolls off the sides of the pile, so the addition of wetting agents may be necessary. Wetting agents used should be free from combustible diluents and the total active matter in the wetting solution should not exceed 1%. This liquid may be added to a hollow up to 3 mm deep and 5 mm in diameter in the top of the pile.

14.5.2.2.1.4 Any suitable ignition source such as a small flame or a hot wire of minimum temperature 1000°C is used to ignite the pile at one end. When the pile has burned a distance of 80 mm, measure the rate of burning over the next 100 mm. For substances other than metal powders, note whether or not the wetted zone stops propagation of the flame for at least 4 minutes. The test should be performed six times using a clean cool plate each time, unless a positive result is observed earlier.

14.5.2.2.2 Criteria for classification

14.5.2.2.2.1 Powdered, granular or pasty substances should be classified in Division 4.1 when the time of burning of one or more of the test runs, in accordance with the test method described in 14.5.2.2, is less than 45 s or the rate of burning is more than 2.2 mm/s. Powders of metals or metal alloys should be classified when they can be ignited and the reaction spreads over the whole length of the sample in 10 minutes or less.

14.5.2.2.2.2 For readily combustible solids (other than metal powders), Packing Group II should be assigned if the burning time is less than 45 s and the flame passes the wetted zone. Packing Group II should be assigned to powders of metal or metal alloys if the zone of reaction spreads over the whole length of the sample in five minutes or less.

14.5.2.2.2.3 For readily combustible solids (other than metal powders), Packing Group III should be assigned if the burning time is less than 45 s and the wetted zone stops the flame propagation for at least four minutes. Packing Group III should be assigned to metal powders if the reaction spreads over the whole length of the sample in more than five minutes but not more than ten minutes."

14.5.3 Replace the text of sub-section 14.5.3 with the following:

"14.5.3.1 Principle of the method and procedure

A test is performed to determine if a solid ignites within five minutes of coming in contact with air. Whether a substance is a pyrophoric solid of Division 4.2 is decided on the basis of the test result. Packing Group I is assigned to all pyrophoric solids.

One to two ml of the powdery substance to be tested should be poured from about 1 m height onto a non-combustible surface and it is observed whether the substance ignites during dropping or within 5 minutes of settling. This procedure should be performed six times unless a positive result is obtained earlier.

14.5.3.2 Criteria for classification

If the sample ignites in one of the tests, the substance should be considered pyrophoric and should be classified in Packing Group I of Division 4.2."

14.5.4 Replace the text of sub-section 14.5.4 with the following:

"14.5.4.1 Principle of the method

A test is performed to determine if a liquid ignites when added to an inert carrier and exposed to air for five minutes. If no ignition occurs then the second part of the test is performed to determine if it chars or ignites a filter paper. Whether a substance is a pyrophoric liquid of Division 4.2 is decided on the basis of the test result. Packing Group I is assigned to all pyrophoric liquids.

14.5.4.2 Procedure

14.5.4.2.1 A porcelain cup of about 100 mm diameter and some diatomaceous earth or silica gel is required for the first part of the test, and small pore size filter paper for the second part.

14.5.4.2.2 A porcelain cup of about 100 mm diameter should be filled with diatomaceous earth or silica gel at room temperature to a height of about 5 mm.

Approximately 5 ml of the liquid to be tested should be poured into the prepared porcelain cup and it is observed if the substance ignites within 5 minutes. This procedure should be performed six times unless a positive result is obtained earlier. If a negative result is obtained then the procedure in 14.5.4.2.3 should be followed.

14.5.4.2.3 A 0.5 ml test sample should be delivered from a syringe to an indented dry filter paper. The test should be conducted at 25 ± 2°C and a relative humidity of 50 ± 5%. Observations are made to see if ignition or charring occurs on the filter paper within five minutes of addition of the liquid. This procedure should be performed three times using fresh filter paper each time unless a positive result is obtained earlier.

14.5.4.3 Criteria for classification

If the liquid ignites in the first part of the test, or if it ignites or chars the filter paper, it should be considered to be pyrophoric and should be classified in Packing Group I of Division 4.2."

14.5.5 Replace the text of sub-section 14.5.5 with the following:

14.5.5.1 Principle of the method

14.5.5.1.1 Tests are performed to determine if substances in a 25 mm or 100 mm sample cube, at test temperatures of 100°C, 120°C or 140°C, undergo spontaneous ignition or dangerous self-heating which is indicated by a 60°C rise in temperature over the oven temperature within 24 hours. The classification scheme is illustrated in figure 14.4. These criteria are based on the self-ignition temperature of charcoal, which is 50°C for a sample cube of 27 m^3. Substances with a temperature of spontaneous combustion higher than 50°C for a volume of 27 m^3 should not be assigned to Division 4.2. Substances with a spontaneous ignition temperature higher than 50°C for a volume of 450 litres should not be assigned to Packing Group II of Division 4.2.

14.5.5.1.2 If dangerous self-heating does not occur with the substance in a 100 mm sample cube at 140°C then the substance is not a self-heating substance of Division 4.2.

14.5.5.1.3 If dangerous self-heating occurs with the substance in a 100 mm sample cube at 140°C then a test with the substance in a 25 mm sample cube should be performed at 140°C to determine if it should be assigned to Packing Group II.

14.5.5.1.4 If dangerous self-heating occurs at 140°C with the substance in a 100 mm sample cube, but not a 25 mm sample cube, then a test with the substance in a 100 mm sample cube should be performed:

at 120°C if it is to be transported in packagings of not more than 3 m^3 volume; or

at 100°C if the substance is to be transported in packagings of not more than 450 litres volume.

Whether Packing Group III of Division 4.2 is assigned or the substance is not a self-heating substance of Division 4.2, in the packaging to be used, is decided on the basis of the test results.

14.5.5.2 Procedure

14.5.5.2.1 The following apparatus is required:

a hot-air circulating type of oven with an inner volume of more than 9 litres and capable of controlling the internal temperature at 100°C, 120° or 140°C ± 2°C;

cubic sample containers of 25 mm and 100 mm side, made of stainless steel net with a mesh opening of 0.05 mm, with their top surface open; and

Chromel-Alumel thermocouples of 0.3 mm diameter; one placed in the centre of the sample and another between the sample container and the oven wall.

Each sample container should be housed in a cubic container cover made from a stainless steel net with a mesh opening of 0.60 mm, and slightly larger than the sample container. In order to avoid the effect of air circulation, this cover is installed in a second stainless steel cage, made from a net with a mesh size of 0.60 mm and 150 x 150 x 250 mm in size.

14.5.5.2.2 The sample, powder or granular, in its commercial form, should be filled to the brim of the sample container and the container tapped several times. If the sample settles, more is added. If the sample is heaped it should be levelled to the brim. The container is housed in the cover and hung at the centre of the oven. The oven temperature should be raised to 140°C and kept there for 24 hours. The temperature of the sample and of the oven should be recorded continuously. The first test */ should be conducted with a 100 mm cube sample. A positive result is obtained if spontaneous ignition occurs or if the temperature of the sample exceeds the oven temperature by 60°C. If a negative result is obtained, no further test is necessary. If a positive result is obtained, a second test should be conducted at 140°C with a 25 mm cube sample to determine whether or not Packing Group II should be assigned. If a positive result is obtained at 140°C with the substance in a 100 mm sample cube, but not a 25 mm sample cube, then an additional test with the substance in a 100 mm sample cube should be performed:

at 120°C if the substance is to be transported in packagings of not more than 3 m^3 volume; or

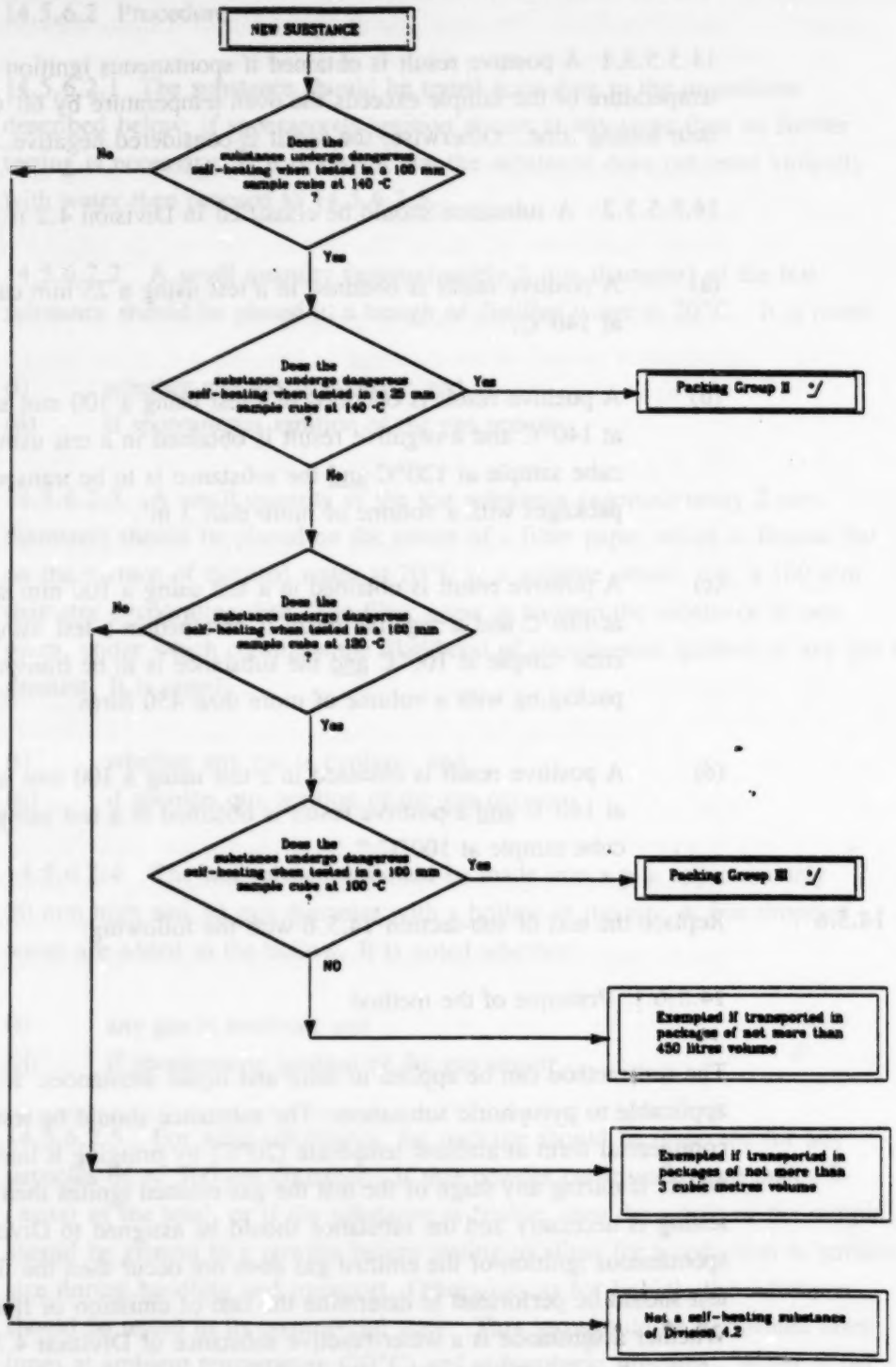
at 100°C if the substance is to be transported in packagings of not more than 450 litres volume."

At the bottom of the page add the following footnote:

*/ The tests may be performed in any order. For example, if it is expected that a positive result will be obtained using a 25 mm cube sample then, for safety and environmental protection, the first test may be performed with a 25 mm cube sample. If a positive result is obtained then a test with a 100 mm cube sample is not necessary.

Figure 14.4: Insert a new Figure 14.4 as follows:

Figure 14.4: CLASSIFICATION OF SELF-HEATING SUBSTANCES


NEW SUBSTANCE
Does the substance undergo dangerous self-heating when tested in a 100 mm sample cube at 140 °C ?
No
Yes
Does the substance undergo dangerous self-heating when tested in a 25 mm sample cube at 140 °C ?
Yes
Packing Group II */
No
Does the substance undergo dangerous self-heating when tested in a 100 mm sample cube at 120 °C ?
No
Yes
Does the substance undergo dangerous self-heating when tested in a 100 mm sample cube at 100 °C ?
Yes
Packing Group III */
NO
Exempted if transported in packages of not more than 450 litres volume
Exempted if transported in packages of not more than 3 cubic metres volume
Not a self-heating substance of Division 4.2

*/ *Substance with a temperature for spontaneous combustion higher than 50 °C for 27 m³ should be classified in Division 4.2*

14.5.5.3 Criteria for classification

14.5.5.3.1 A positive result is obtained if spontaneous ignition occurs or if the temperature of the sample exceeds the oven temperature by 60°C during the 24 hour testing time. Otherwise, the result is considered negative.

14.5.5.3.2 A substance should be classified in Division 4.2 if:

(a) A positive result is obtained in a test using a 25 mm cube sample at 140°C.

(b) A positive result is obtained in a test using a 100 mm sample cube at 140°C and a negative result is obtained in a test using a 100 mm cube sample at 120°C and the substance is to be transported in packages with a volume of more than 3 m^3.

(c) A positive result is obtained in a test using a 100 mm sample cube at 140°C and a negative result is obtained in a test using a 100 mm cube sample at 100°C and the substance is to be transported in packaging with a volume of more than 450 litres.

(d) A positive result is obtained in a test using a 100 mm sample cube at 140°C and a positive result is obtained in a test using a 100 mm cube sample at 100°C."

14.5.6 Replace the text of sub-section 14.5.6 with the following:

14.5.6.1 Principle of the method

The test method can be applied to solid and liquid substances. It is not applicable to pyrophoric substances. The substance should be tested in its commercial form at ambient temperate (20°C) by bringing it into contact with water. If during any stage of the test the gas emitted ignites then no further testing is necessary and the substance should be assigned to Division 4.3. If spontaneous ignition of the emitted gas does not occur then the final stage of the test should be performed to determine the rate of emission of flammable gas. Whether a substance is a water-reactive substance of Division 4.3 and, if so, whether Packing Group I, II or III should be assigned is decided on the basis of

the test result.

14.5.6.2 Procedure

14.5.6.2.1 The substance should be tested according to the procedures described below; if spontaneous ignition occurs at any stage then no further testing is necessary. If it is known that the substance does not react violently with water then proceed to 14.5.6.2.5.

14.5.6.2.2 A small quantity (approximately 2 mm diameter) of the test substance should be placed in a trough of distilled water at 20°C. It is noted:

(i) whether any gas is evolved; and
(ii) if spontaneous ignition of the gas occurs.

14.5.6.2.3 A small quantity of the test substance (approximately 2 mm diameter) should be placed on the centre of a filter paper which is floated flat on the surface of distilled water at 20°C in a suitable vessel, e.g. a 100 mm diameter evaporating dish. The filter paper is to keep the substance in one place, under which condition the likelihood of spontaneous ignition of any gas is greatest. It is noted:

(i) whether any gas is evolved; and
(ii) if spontaneous ignition of the gas occurs.

14.5.6.2.4 The test substance should be made into a pile approximately 20 mm high and 30 mm diameter with a hollow in the top. A few drops of water are added to the hollow. It is noted whether:

(i) any gas is evolved; and
(ii) if spontaneous ignition of the gas occurs.

14.5.6.2.5 For solid substances, the package should be inspected for any particles of $< 500\ \mu m$ diameter. If that powder constitutes more than 1% (mass) of the total, or if the substance is friable, then the whole of the sample should be ground to a powder before testing to allow for a reduction in particle size during handling and transport. Otherwise, as for liquids, the substance should be tested in its commercial state. This test should be performed three times at ambient temperature (20°C) and atmospheric pressure. Water is put

into the dropping funnel and enough of the substance (up to a maximum mass of 25 g) to produce between 100 ml and 250 ml of gas is weighed and placed in a conical flask. The tap of the dropping funnel is opened to let the water into the conical flask and a stop watch is started. The volume of gas evolved is measured by any suitable means. The time taken for all the gas to be evolved is noted and where possible, intermediate readings are taken. The rate of evolution of gas is calculated over 7 hours at 1 hour intervals. If the rate of evolution is erratic or is increasing after 7 hours, the measuring time should be extended to a maximum time of 5 days. The five day test may be stopped if the rate of evolution becomes steady or continually decreases and sufficient data has been established to assign a packing group to the substance or to determine that the substance should not be classified in Division 4.3. If the chemical identity of the gas is unknown, the gas should be tested for flammability.

14.5.6.3 Criteria for classification

14.5.6.3.1 A substance should be classified in Division 4.3 if:

(a) spontaneous ignition takes place in any step of the test procedure; or

(b) there is an evolution of a flammable gas at a rate greater than 1 litre per kilogram of the substance per hour.

14.5.6.3.2 Packing Group I should be assigned to any substance which reacts vigorously with water at ambient temperatures and generally demonstrates a tendency for the gas produced to ignite spontaneously, or which reacts readily with water at ambient temperatures such that the rate of evolution of flammable gas is equal to or greater than 10 litres per kilogram of substance over any one minute period.

14.5.6.3.3 Packing Group II should be assigned to any substance which reacts readily with water at ambient temperatures such that the maximum rate of evolution of flammable gas is equal to or greater than 20 litres per kilogram of substance per hour, and which does not meet the criteria for Packing Group I.

14.5.6.3.4 Packing Group III should be assigned to any substance which reacts slowly with water at ambient temperatures such that the maximum rate of evolution of flammable gas is greater than 1 litre per kilogram of substance per hour, and which does not meet the criteria for Packing Groups I or II."

2. Amend Table 14.1 as follows:

SELF-REACTIVE SUBSTANCE	Concentration (%)	Packing Method	Control temperature (°C)	Emergency temperature (°C)	UN Generic entry	Remarks
Amended entry						
AZODICARBONAMIDE FORMULATION TYPE B, TEMPERATURE CONTROLLED	< 100	OP5			3232	(1)(2)
New entry						
AZODICARBONAMIDE FORMULATION TYPE C	< 100	OP6			3224	(3)
Amended entry						
AZODICARBONAMIDE FORMULATION TYPE C, TEMPERATURE CONTROLLED	< 100	OP6			3234	(4)
New entry						
AZODICARBONAMIDE FORMULATION TYPE D	< 100	OP7			3226	(5)
Amended entry						
AZODICARBONAMIDE FORMULATION TYPE D, TEMPERATURE CONTROLLED	< 100	OP7			3236	(6)
New entry						
DIETHYLENE GLYCOL BIS(ALLYL CARBONATE) + DI-ISOPROPYL-PEROXYDICARBONATE	≥ 88 + ≤ 12	OP8	-10	0	3237	
Corrected entry						
4-METHYLBENZENESULPHONYL-HYDRAZIDE	100	OP7			3226	

In the remarks after the table:

Renumber (3) as (4), (4) as (6), (5) as (7) and (6) as (8).

Insert two new remarks (3) and (5) as follows:

"(3) Azodicarbonamide formulations which fulfil the criteria of 14.2.2.4.2(c)."

"(5) Azodicarbonamide formulations which fulfil the criteria of 14.2.2.4.2(d)."

CHAPTER 15: SPECIAL RECOMMENDATIONS FOR DANGEROUS GOODS IN LIMITED QUANTITIES

1. Amend the following paragraphs:

Paragraph

15.1 In the last sentence delete the words "United Nations" and insert after "Recommendations" the words "on the Transport of Dangerous Goods".

15.2 (e) Amend to read:

"(e) Organic peroxides requiring temperature control of Division 5.2".

Delete footnote [1/].

2. In Table 15.1 amend the last sentence of footnotes b/ and c/ to read "See 11.3.3 and 11.3.5.".

3. Add the following entries to Table 15.2:

UN Number	Proper shipping name	Maximum quantity per inner packagings
1990	BENZALDEHYDE	5 l
3077	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.	5 kg
3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	5 l

CHAPTER 16 RECOMMENDATIONS ON INTERMEDIATE BULK CONTAINERS (IBCs)

Paragraph

16.1.2.1 In the first sentence delete the term "semi-rigid".

16.1.2.2.1 In table (a) delete the row starting with "Semi-rigid".

16.1.3.2 Amend to read:

"IBCs should be so constructed and closed that none of the contents can escape under normal conditions of transport including the effects of vibration, or by changes in temperature, humidity or pressure."

16.1.6.6 Amend to read:

"An empty IBC that has contained a dangerous substance should be treated in the same manner as is required by these Recommendations for a filled IBC, unless adequate measures have been taken to nullify any hazard."

16.2.3.6 (b) In the formula replace "*x*" by the multiplication sign.

16.3.3.9 Amend "sift proof" to read "sift-proof".

16.4.8.1 Amend to read:

"16.4.8.1 Additional steps should be taken to ascertain that the plastics material used in the manufacture of rigid plastics IBCs of types 31H1 and 31H2 complies with the provisions of 16.4.3.1 to 16.4.3.3."

16.5.3.1.1 Add the following text:

"A "rigid" inner receptacle is a receptacle which retains its general shape when empty without closures in place and without benefit of the outer casing. Any inner receptacle that is not "rigid" is considered to be "flexible"."

16.5.3.1.3 Add a new paragraph as follows:

"16.5.3.1.3 IBCs of type 31HZ2 should be limited to a capacity of not more than 1250 litres."

16.5.3.2.6 Add a new paragraph as follows:

"16.5.3.2.6 The inner receptacle of IBCs type 31HZ2 should consist of at least three plies of film."

16.5.3.3.11 Add a new paragraph as follows:

"16.5.3.3.11 The outer casing of IBCs type 31HZ2 should enclose the inner receptacle on all sides."

16.5.8.1 Amend to read:

"16.5.8.1 Additional steps should be taken to ascertain that the plastics material used in the manufacture of composite IBCs of types 31HZ1 and 31HZ2 complies with the provisions of 16.5.3.2.1 to 16.5.3.2.3."

16.5.9.1.3 Replace "0.75" by "three quarters" (twice).

16.5.9.3.3 Amend the second and third sentences to read:

"Except for IBCs with an outer casing of plastics material, which bear the stacking load, IBCs should be subjected to the test for 24 hours. IBCs with outer casings of plastics material, which bear the stacking load (i.e., types 11HH1, 11HH2, 21HH1, 21HH2, 31HH1 and 31HH2) should be subjected to the test for 28 days at 40 °C."

16.5.10 Existing text becomes 16.5.10.1.

Add a new subparagraph 16.5.10.2 as follows:

"16.5.10.2 The inner receptacle of composite IBCs should be marked with at least the following information:

(a) The name or symbol of the manufacturer and other identification of the IBC as specified by the competent authority as in 16.1.5.1 (f);

(b) The date of manufacture, as in 16.1.5.1 (d); and

(c) The distinguishing sign of the State authorizing the allocation of the mark, as in 16.1.5.1 (e)".

Add a new subparagraph 16.5.10.3 as follows:

"16.5.10.3 Where the outer casing of composite IBCs can be dismantled, each of the detachable parts should be marked with the month and year of manufacture and the name or symbol of the manufacturer and other identification of the IBC as specified by the competent authority (16.1.5.2(f))."

16.5.11.3 Add a new paragraph as follows:

"16.5.11.3 IBCs of type 31HZ2 should be filled to at least 80% of the volume of the outer casing."

16.5.11.4 Add a new paragraph as follows:

"16.5.11.4 In addition, IBCs of type 31HZ2 should always be carried in closed transport units."

16.6.6.1.3
16.7.6.1.3 Replace "0.75" by "three quarters" (twice).

APPENDIX A: LIST OF GENERIC OR N.O.S PROPER SHIPPING NAMES

1. Amend as necessary in accordance with amendments adopted for Chapter 2.

2. Amend the last sentence in the first paragraph "An asterisk...(see 13.8.4)." to read as follows:

"This proper shipping name should be supplemented by the technical name when special provision 274 has been assigned to the entry (column (b3) in Chapter 2) (see 13.8.4)."

3. In the first entry add "Class 1, UN 0190" (correction)

4. Delete the reference to FLUOROANILINES in Division 6.1.

INDEX

1. Amend the existing entries in the Index and add new entries in accordance with the amendments to Chapter 2.

2. In note 4. to the index amend "shippping" to read "shipping" (English text only).

3. Add the following entries in the Index:

"n-Butyl bromide, see	3	1126"
"Methyl alcohol, see	3	1230"
"Propylene dichloride, see	3	1279"

4. Add R numbers in the Index as follows:

"REFRIGERANT GAS R12, see	2.2	1028
REFRIGERANT GAS R12B1, see	2.2	1974
REFRIGERANT GAS R13, see	2.2	1022
REFRIGERANT GAS R13B1, see	2.2	1009
REFRIGERANT GAS R14, see	2.2	1982
REFRIGERANT GAS R21, see	2.2	1029
REFRIGERANT GAS R22, see	2.2	1018
REFRIGERANT GAS R23, see	2.2	1984
REFRIGERANT GAS R32, see	2.1	3252
REFRIGERANT GAS R40, see	2.1	1063
REFRIGERANT GAS R41, see	2.1	2454
REFRIGERANT GAS R114, see	2.2	1958
REFRIGERANT GAS R115, see	2.2	1020
REFRIGERANT GAS R116, see	2.2	2193
REFRIGERANT GAS R124, see	2.2	1021
REFRIGERANT GAS R125, see	2.2	3220
REFRIGERANT GAS R133a, see	2.2	1983
REFRIGERANT GAS R134a, see	2.2	3159
REFRIGERANT GAS R142b, see	2.1	2517
REFRIGERANT GAS R143a, see	2.1	2035
REFRIGERANT GAS R152a, see	2.1	1030

REFRIGERANT GAS R161, see	2.1	2453
REFRIGERANT GAS R218, see	2.2	2424
REFRIGERANT GAS R1132a, see	2.1	1959
REFRIGERANT GAS R1216, see	2.2	1858
REFRIGERANT GAS R1318, see	2.2	2422
REFRIGERANT GAS RC318, see	2.2	1976"

5. Insert the words "REFRIGERANT GAS" before R227, R500, R503.

6. Change the UN Number for BATTERIES, CONTAINING SODIUM from 3293 to 3292.

7. Replace the entry:

"ENGINE STARTING FLUID with flammable gas 2.1 1960"

with

"Engine starting fluid with flammable gas, see 2.1 1950"

8. Replace the name "PENTAN-2,4-DIONE" with "PENTANE-2,4-DIONE".

9. Replace the name "Dinitroluenes, molten" with "Dinitrotoluenes, molten".